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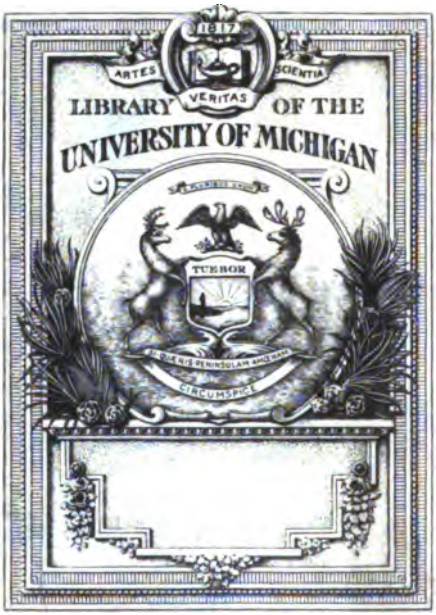

THE GIFT OF

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1841

THE

AMERICAN FRUIT CULTURIST,

CONTAINING DIRECTIONS FOR THE

PROPAGATION AND CULTURE OF FRUIT TREES,

IN THE

NURSERY, ORCHARD, AND GARDEN,

WITH DESCRIPTIONS OF

THE PRINCIPAL AMERICAN AND FOREIGN VARIETIES,

CULTIVATED IN THE UNITED STATES.

BY JOHN J. THOMAS.

ILLUSTRATED WITH THREE HUNDRED ACCURATE FIGURES.

AUBURN:
DERBY, MILLER, & COMPANY.
.....
1849.

Entered according to act of Congress, in the year 1849, by
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PREFACE.

THE favorable reception of several editions of the Fruit Culturist, has induced the author to revise it thoroughly. The whole has been carefully re-written, and the original amount of matter more than tripled; at the same time the attempt has been made to comprise all the really valuable information at present known, by condensation of language, methodical arrangement, and a free use of illustrations.

Careful attention has been given to uniformity and distinctness in the use of terms for describing fruits, and variable points have been as much as possible discarded. Nearly all the descriptions have been drawn from the fruits themselves, carefully compared with descriptions in the principal standard works; and to facilitate the detection of such points of character as are liable to vary with climate, soil, and culture, specimens for comparison have been largely procured, grown in several different states of the Union.

In the difficult task of indicating the value of the different varieties, by the type used for the name, important assistance has been rendered by several eminent pomologists in the different states. The thanks of the author are especially due to the following, who have contributed a large amount of valuable information, or have liberally furnished specimens of rare varieties:—

MARSHALL P. WILDER, Boston;

(For many years President of the Massachusetts Horticultural Society, and President of the American Congress of Fruit Growers.)

SAMUEL WALKER, Roxbury, Mass.;

(President of the Massachusetts Horticultural Society.)

ROBERT MANNING, Pomological Garden, Salem, Mass.;

BENJAMIN V. FRENCH, Braintree, Mass.;

(Vice-President of the Massachusetts Horticultural Society.

A. J. DOWNING, Newburgh, N. Y.;

(Author of Fruits and Fruit Trees of America, and other standard works on Horticulture.)

CHARLES DOWNING, Newburgh, N. Y.;

LUTHER TUCKER, Albany;

(Proprietor of the Horticulturist, and Editor and Proprietor of the Cultivator.

SANFORD HOWARD, Albany;
(Associate Editor of the Cultivator.)
Dr. W. D. BRINCKLE, Philadelphia;
(Chairman of the Fruit Committee of the Pennsylvania Horticultural Society.)
THOMAS S PLEASANTS, Petersburgh, Va.;
P. BARRY, Rochester, N. Y.;
(Horticultural Editor of the Genesee Farmer.)
F. R. ELLIOTT, Cleveland, Ohio;
(Secretary of the Ohio Fruit Convention.)
A. H. ERNST, Cincinnati;
(President of the Cincinnati Horticultural Society, and of the Ohio Fruit Convention.)

In addition to the preceding, the author would not do justice to his feelings, without expressing his acknowledgments to the many who have kindly furnished specimens of rare fruits, among whom are ELLWANGER & BARRY, and J. W. BISSEL, Rochester; W. R. SMITH, Macedon; B. HODGE, Buffalo; A. MCINTOSH, Cleveland; F. K. PHOENIX, Delavan, Wisconsin; C. W. ELLIOTT, Cincinnati; THOMAS HANCOCK, Burlington, New Jersey; GEORGE GABRIEL, New Haven; and SAMUEL H. COLTON, Worcester, Mass.

From his father, David Thomas, he has derived the knowledge of many valuable facts relative to the cultivation and management of Fruit.

Much valuable information has been obtained from the various works on American Fruits, among which are Downing's invaluable treatise on Fruits and Fruit Trees, Hovey's Magazine, and the Horticulturist.

The condensed style of the work forbids a frequent reference to these various authorities, and this general acknowledgment is more especially due.

The numerous figures of fruits, have, with very few exceptions, been drawn by the author from average well grown specimens, by a mode giving exact impressions of the original

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CHAPTER I.

INTRODUCTORY REMARKS.

The climate and soil of our country afford unequalled facilities for the cultivation of fruit. A rich treasure lies within the reach of its inhabitants, in the profusion of delicious kinds, which successive months may be made to supply. Yet, a small portion have availed themselves fully of these advantages. Even the existence of most of the finer varieties, are but partially known. The rapid increase of fruit culture within the past few years, has but thinly spread its bounties over a widely expanded and thickly peopled territory.

In traversing the country, neat cottages and comfortable farm-houses are seen everywhere interspersed, and plenty is indicated by loaded orchards and abundant harvests. But how many of the prosperous owners are aware of the rare delicacies their fertile lands are capable of yielding? How many of them, for instance, are familiar with that perfumed, golden, midsummer fruit, the apricot? What portion cultivate enough of the best peaches to obtain "from the loaded bough the mellow shower," for ten successive weeks? What number know that plums, rich, juicy, and bloom-dusted, may be had fresh from the tree, from early wheat harvest till the ground freezes in autumn? Who among them partake of the twenty best melting pears, out of the thousand varieties which have borne fruit in this country? And especially, who practically knows, that a whole yearly circle of fruits is within his reach, beginning with the most refreshing strawberries, raspberries, and cherries, for early summer; including the richest plums, apricots, peaches, and nectarines, for summer and autumn; and closing with high-flavored pears and apples, extending their season of ripening through all autumn and winter, and far into the suc-

ceeding year? Happily, the number of cultivators is rapidly increasing, who may place upon their tables many delicious sorts, on almost any day of the entire year.

The cultivation of fruit has been retarded by a mistaken estimate of the time required for young trees to come into bearing. But this error is fast disappearing before skilful culture. It is become well known, that he who plants trees, plants for himself, as well as for his children. Bad treatment may long retard the growth and bearing of a tree. Enveloped in weeds and grass, what young plant could flourish? What farmer would think a moment of raising good corn in the thick and tall grass of a meadow? No wonder, then, that a young tree, similarly treated, lingers in feebleness and disease. But give it for a few years a mellow, clean, and fertile soil, and vigorous shoots, and expanding branches, will soon bend under copious loads of fruit. To adduce instances,—in a single garden, apple trees, the fifth year from setting out, yielded a bushel each; peach trees, the third summer, bore three pecks; and a Bartlett pear, two years from transplanting, gave a peck of superb fruit; none of them were an inch in diameter when transplanted, r[illegible]s th[illegible] treatment better than that which every good fa[illegible] gives his carrots and potatoes.

PROFITS.

It can be hardly necessary, with our present rapidly increasing commerce in fruit, to point out the pecuniary profits resulting from its culture. But those who have only raised the more common, or second-rate sorts, can hardly appreciate the heavy returns from the finest, under the best culture. To such, a few examples may be interesting.*

C. A. Cable, of Cleveland, Ohio, obtained in 1845, from an orchard of one hundred cherry trees, twenty years old, more than one thousand dollars. The trees were twenty-five feet apart, and no other crop occupied the ground, which was enriched and kept well cultivated.

Hill Pennell, of Darby, Pa., sold in 1846, two hundred and twenty-five dollars worth of early apples, from half an acre.

A farmer near Fishkill, N. Y. sold fifteen hundred dollars worth of plums in a single season. Richard I. Hand,

* Taken chiefly from the "Horticulturist."

of Mendon, Monroe county, N. Y., sold in 1845, four hundred and forty dollars worth of Roxbury Russet and Northern Spy apples from one acre of orchard.

James Laws, of Philadelphia, sold three hundred dollars worth of Isabella and Catawba grapes, the fourth year from planting, from three-eighths of an acre, or at the rate of eight hundred dollars per acre.

Hugh Hatch, of Camden, N. J., obtained from four trees of the Tewksbury Blush, one hundred and forty bushels of apples, or thirty-five from each tree; of these ninety baskets (of about three pecks each) sold late in the following spring for one dollar per basket.

Examples almost beyond number may be given where single trees have yielded from five to ten dollars a year in fruit, and many instances where twenty or thirty dollars have been obtained. An acre of such would be equal to any of the preceding instances. If one tree of the Rhode Island Greening will afford forty bushels of fruit, at a quarter of a dollar per bushel, which has often occurred, forty such trees on an acre would yield a crop worth four hundred dollars. But taking but one quarter of this amount as a low average for all seasons and with imperfect cultivation, one hundred dollars would still be equal to the interest of fifteen hundred per acre. Now, this estimate is based upon the price of good winter apples for the past thirty years, in our most productive districts; let a similar calculation be made with fruits rarer and of a more delicious character. Apricots, and the finer varieties of the plum, are often sold for three to six dollars per bushel; the best early peaches from one to three dollars; and pears, from hardy and productive trees, for an equal amount. Of the three former kinds, two to five bushels per tree, with good management, is a frequent crop; and on large pear trees five times this quantity. An acquaintance received eight dollars for a crop grown on two fine young cherry trees, and twenty-four dollars from four young peach trees, of only six years growth from the bud. In western New-York, single trees of the Doyenné or Virgalieu pear have often afforded a return of twenty dollars or more, after being sent hundreds of miles to market. An acre of such trees, well managed, would far exceed in profits a fine hundred-acre farm.

But the anxious inquiry is suggested, "Will not our markets be surfeited with fruit?" This will depend upon the judgment and discretion of cultivators. With the exception of the peaches of Philadelphia, and the strawberries of Cincinnati, a great deficiency is still felt in all our large cities. Of these two fruits, large plantations are brought rapidly into full bearing. The fruit, when ripe, quickly perishes, and cannot be kept a week; yet thousands of acres in peach trees, bending under their heavy crops, are needed for the consumption of the one city, and broad fifty-acre fields, reddened with enormous products, send many hundred bushels of strawberries daily into the other. If, instead of keeping but three days, sorts were now added which would keep three months, many times the amount would be needed. But the market would not be confined to large cities. Railroads and steamboats would open new channels of distribution throughout the country, for increased supplies. Nor would the business stop here. Large portions of the eastern continent would gladly become purchasers, as soon as sufficient quantities should create facilities for a resonable supply. Our best apples are already eagerly bought in London and Liverpool, where nine dollars per barrel is not an unusual price for the best Newtown pippins. And by packing in ice, Doyennè pears, gathered early in autumn in New-York, have been sold at mid-winter in Calcutta—peaches have been safely sent to Jamaica—and strawberries to Barbadoes. The Baldwin apple has been furnished in good condition in the East Indies, two months after it is entirely gone at Boston.*

Good winter apples always command a market. For the past thirty years such fine varieties as the Swaar, Rhode Island Greening, and Esopus Spitzenburgh, have scarcely varied from twenty-five cents a bushel in some of the most productive portions of the country, remote from market. Late keepers are sold early in the summer for more than triple that sum. An acre of forty trees, with good culture, will average through all seasons not less than two hundred bushels, or fifty dollars a year. Instances are frequent of thrice this amount. The farmer, then, who sets out twenty acres of good apple orchard, and takes care of it, may expec-

* Hort. vol. I, p. 288.

at no remote period a yearly return of five to fifteen hundred dollars a year, and even more, if a considerable portion is occupied with late keepers. This is, it is true, much more than the majority obtain; but the majority wholly neglect cultivating and enriching the soils of their orchards.

It is not, however, merely as a source of income, that the cultivation of the finer kinds become profitable. The family which is at all times supplied with delicious and refreshing fruit from its own gardens, has within its reach not only a very important means of economy, but of real domestic comfort. An influence is thus introduced of an exalted character; a tendency is directly exerted towards the improvement of the manners of the people. Every addition to the attractions of home, has a salutary bearing on a rising family of children. The difference between a dwelling with well planted grounds, and well furnished with every rural enjoyment, and another where scarcely a single fruit tree softens the face of bleakness and desolation, may, in many instances, and to many a young man just approaching active life, serve as the guiding influence between a useful life on the one hand, or a roving and unprofitable one on the other—between a life of virtue and refinement from early and favorable influences, or one of dissipation and ruin from the overbalancing effects of a repulsive home. Nor can any man, even in the noon or approaching evening of life, scarcely fail to enjoy a higher happiness, with at least an occasional intercourse with the blossoming and loaded trees which his own hand has planted and pruned, than in the noise of the crowd and tumult of the busy world.

CHAPTER II.

HISTORY, IMPROVEMENT, AND NOMENCLATURE.

The earliest fruits mentioned in history, are the grape, the apple, and the fig, the former having been cultivated about the time of the deluge. The almond is mentioned repeatedly in the sacred records, nearly 4000 years ago; and Theophrastus, who lived about 300 years before the Christian era, remarks that it was the only tree in Greece that produced blossoms before the leaves; hence we may safely infer that the peach was then unknown. The fact that the Jewish history no where speaks of the peach, indicates that it was not a native of Persia, a country long inhabited by that people.* It was doubtless, however, early introduced there. It was known to the Romans at the height of their power, and the nectarine was spoken of by Columella and by Pliny, as an admired fruit of their time.

The Romans extended their conquests into nearly all parts of the known world, and brought back the horticultural productions adapted to the climate of Italy. The fig was obtained from Syria, the peach from Persia, the citron from Media, the pommegranate from Africa, the apricot from Epirus, apples, pears, and plums, from Armenia, and cherries from Pontus. When the Empire was at the height of its power, or towards the close of the first century, the following fruits, cultivated at Rome, were enumerated by Pliny:

Apples, 22 varieties;
Pears, 36 "
Cherries, 8 "
Quinces, 3 "
Grapes, numerous varieties;
Plums, many sorts, black, white, and variegated;

* It is found *wild* on the Himalayan mountains, whence it was probably carried to Persia, and to other parts of the world.

Figs, many; black and white, large and small;
Almonds, sweet and bitter;
Medlars, larger and smaller;
Mulberries, two black varieties;
Nuts, hazel and filberts;
Strawberries, and *Apricots*.

The orange is supposed to have been introduced at Rome at a later period.

The art of Grafting, so indispensible to the diffusion of the finer fruits, was well known to the ancients, but its origin is hid in the obscurity of antiquity. It does not appear to have been known in the age of Homer, and is thought to have been first practiced not far from the time of Hesiod. It was familiar to the ancient Greeks of a later period; and the Roman writers describe a great variety of modes, quite as ingenious as the fanciful variations now used by gardeners.

The statements of ancient writers, when not confined to simple historical record, partook largely of the conjectural, and frequently of the marvellous. Hence we find Pliny asserting that when plums were grafted upon apple stocks, they produced what were called apple-plums; and upon almond stocks, they yielded a fruit of a compound nature, the stone being like that of the almond. And Virgil, with a little more poetical freedom, speaks of grafting apples on planes; of adorning the wild ash with the blossoms of the pear; and represents swine as crunching acorns under elms.

After the fall of the Empire, the reign of violence nearly extinguished the taste for the improvements of gardening, and destroyed the means of enjoying rural life. Nearly the only exceptions were furnished by the monks, who labored with their own hands in the cultivation of the soil.

At the close of the eighth century, Charlemagne recommended the culture of apples, pears, and plums, and gave great encouragement to the establishment of orchards and vineyards. His friendly intercourse with the Saracenic prince, Haroun al Raschid, enabled him to procure and introduce into France, the best sorts of melons, figs, peaches, and other fruits, in existence at that time.

When Europe gradually emerged from the night of the dark ages, the increased light diffused by the spread of lite-

rature and science, was accompanied with a corresponding increase in the arts of cultivation. We have but little information, however, on this subject, till about three hundred years ago. England, France, and the Low Countries, seem to have taken the lead in improvement. The earliest British writer on the culture of fruit, was Richard Arnold, who published a chapter in his "Chronicles," in 1502, "On the crafte of graftynge and plantynge, and alterynge of fruits, as well in color as in taste." He was succeeded about 1538, by Tusser, who mentions apples, pears, peaches, apricots, cherries, plums, grapes, medlars, barberries, filberts, gooseberries, raspberries, and strawberries. The fig, the orange, and the pommegranate, were introduced about the same period; so that, by the middle of the sixteenth century there were cultivated all the kinds or primary varieties known at the present day.

Tusser was followed in 1597, by Gerard, and in 1629, by Parkinson. The former thus speaks of the apple of his time:—

"The fruit of apples do differ in greatness, form, color, and taste; some covered with a red skin, others yellow or green, varying exceedingly; some very great, some little, and many of a middle sort; some are sweet of taste, or something sour; most are of a middle taste, between sweet and sour; the which to distinguish I think it impossible, notwithstanding I hear of one that intended to write a peculiar volume, of apples, and the use of them."

The number of varieties described or mentioned by Parkinson in 1629, show their cultivation to have become extensive; among them were,

Apples,	58	varieties;
Pears,	64	"
Plums,	61	"
Peaches,	21	"
Cherries,	36	"
Grapes,	23	"
Nectarines,	5	"
Apricots,	6	"
Figs,	3	"

Parkinson was followed by Evelyn, who flourished during the middle of the seventeenth century, and gave by his

writings and active influence, a great impetus to rural culture. The great Brompton Nursery of Loudon and Wise, during the early part of the eighteenth century, disseminated vast quantities of fruit trees over the kingdom. Miller published his Gardeners' Dictionary in 1724; Forsyth his Treatise on Fruit Trees in 1791. The London Horticultural Society was instituted early in the present century, and in connexion with the earlier investigations of its president, Thomas Andrew Knight, and the later and unwearied labors of Robert Thompson, it has poured a flood of light on the science of cultivation, and on the nomenclature of fruits.

The Dutch made early advancement in the cultivation of fruit, and at the close of the sixteenth century, they were familiar with the principal kinds of fruit now cultivated, except the pine apple, which was newly introduced into Belgium and England about that time. The French made a nearly similar progress. Quintinge, during the reign of Louis XIV., or during the latter part of the 17th century, did much for the art by his writings and labors, and developed an excellent system of pruning, which has since proved of the highest importance in the cultivation of wall and espalier trees.

In the United States, the art, and the materials for its practice, have been mostly derived from England, and to a considerable extent from France and Germany. Many of the best European varieties have proved to be fine fruits here, but a larger portion do not appear well fitted to our climate; and most of our richest varieties of apples and peaches are of American origin.

The gradual progress of pomology is indicated in part by the increasing number of varieties successively named or described by the various authors for the past few centuries. Apples "of all sorts" are mentioned by Tusser; Parkinson enumerates sixty-seven; Hartlib, in 1650, alluded to one cultivator who possessed two hundred, and believed there were not less than five hundred; Ray, in 1668, says there were seventy-eight cultivated in the London nurseries; Forsyth, in 1806, describes a hundred and ninety-six kinds; George Lindley, in 1831, minutely and accurately described two hundred and fourteen; while the Fruit Catalogue of the London Horticultural Society gives a list of fourteen

hundred varieties, collected and cultivated by that society, three-fourths of which were found to be either the same fruit under different names, or else unworthy of cultivation. The same remark will apply, at least in part, to the many hundreds offered for sale in the United States.

A similar progress, less in degree, is indicated in the cultivation of the pear. Tusser speaks of "all sorts;" Parkinson enumerates sixty-four varieties; Miller eighty; and Lindley describes one hundred and sixty-two.

Most of these writers also mention numerous varieties of the cherry and plum.

Gerard describes the early, and the white, red, and yellow peaches, and says there were many others; Parkinson enumerates twenty-one; Miller thirty-one; Lindley describes sixty; and in this country, more favorable to the peach than England, there are probably not less than two or three hundred known and named varieties.

Eminent advantages have resulted from the application of scientific principles, by Lindley, Knight and others, in the propagation of improved varieties. Several hundred new pears some of them of fine quality, were obtained by Van Mons of Belgium, by a successive selection of improved seedlings; and Knight, in England, has produced some of the finest varieties of the cherry, plum, and apple, by a cross fertilization of old sorts.

One of the greatest difficulties yet remaining, is the confusion in the names of varieties. The very slight shades of difference in some; the unsuccessful attempts at accurately defining these shades in written descriptions; and the changes produced by soil, situation, climate, and culture, have largely increased the difficulty. This confusion has been augmented by the multitude of names given in some instances to a single fruit. The celebrated White Doyenné or Virgalieu pear, is variously known by thirty different names; the Brown Beurré, fourteen; several others have nearly an equal number. The confusion from various applications of these different names by different cultivators, may be easily imagined. The varieties of the peach which Lindley, an eminent British writer, describes as Grosse Mignonne, Neil's Early Purple, Pourpree Hative, Royal Kensington, and Superb Royal, are all described as a single va-

riety by McIntosh, another British writer, under the name Grosse Mignonne, to which he adds twenty-seven synonyms.

The labors of the London Horticultural Society have contributed much towards removing the bewildering confusion into which the numerous fruits and their names were thrown. Large collections were made from different countries; and by a careful and minute examination for many successive years, innumerable mistakes were corrected. The Massachusetts Horticultural Society, at Boston, in connection with the labors of the late Robert Manning, of Salem, (whose collection of pears alone contained eight hundred sorts,) have tended greatly towards the same useful end in this country. The subject is also receiving much attention in various parts of the United States. The indispensible necessity of a more thorough examination of fruits by those who propagate them for sale, is more appreciated and becoming reduced to practice. Many extensive private collections of American and European fruits have recently been made, or greatly augmented, for the purpose of a more thorough examination, comparison, and selection of varieties. These, in connection with the increased facilities for an interchange of fruits and information, cannot fail to pour a flood of light upon the darkness which has so long enveloped this branch of the subject; to lead to a greater uniformity in names, and accuracy in their application; to point out those only which are worthy of general cultivation, and to lead to the rejection of the hundreds which, possessing good qualities, do not come up to the high standard of excellence which should be adopted by every enlightened cultivator and disseminator of fruits.

CHAPTER III.

PRODUCTION OF NEW VARIETIES.

THE tendency is more or less common with all plants, when successively produced from seed, to depart from the character first stamped upon them. These departures give rise to new varieties. In their native forests, many trees and plants do not exhibit these changes, either because they are slight and obscure, or in consequence of the inflexible nature of the species. With others, varieties are conspicuous; examples of which may be seen in the White Spruce, a part of the trees presenting rigid, erect branches, in contrast with the drooping aspect of others; in the American Elm, the branches, in rare instances, being as pendant as the weeping willow; in the more brilliant glow of red flowers on some trees of the Red Maple; and in the diversity of size, form, and flavor of the wild plum of the woods.

This tendency to vary is increased as plants are removed from their native localities; and in an eminent degree by cultivation. Planted in gardens, and subjected to high culture, repeated and successive sowings often develope striking changes from the appearances which for previous centuries had remained unchanged. By a constant selection of seeds from the best, a gradual improvement on the original is effected. Most of our finest fruits, doubtless owe their existence to this improving process.*

"If," says Downing, "we sow a quantity of seed in gar-

* The distinction between *species* and *varieties* should be well understood. A single species, or original, distinct, individual plant, often includes many varieties. All the varieties of one species, are from the same original plant; the thousands which have been named of the single species, the apple, are but a small portion of the myriads which have been actually produced. Successive plantings have given us sorts as different in size as the Monstrous Pippin and the minute Lady Apple; or as remote in flavor as the harsh and astringent Hewes Crab, and the rich and honied Bough. But widely different as these may be, they can never pass the boundary of the species—an apple can never be changed to a pear, a cherry to a plum, nor a gooseberry to a currant.

den soil, of the common black mazzard cherry, we shall find that, in the leaves and habit of growth, many of the seedlings do not entirely resemble the original. When they come into bearing, it is probable we shall also find as great a diversity in the size, color, and flavor of the fruit, though only a few, perhaps only one, may be superior to the original species.

"Exactly in proportion as this reproduction is frequently repeated, is the change to a great variety of forms, or new sorts, increased. It is likely, indeed, that to gather the seeds from the wild mazzard of the woods, the instances of departure from the form of the original species would be very few; while if gathered from a garden tree, itself sometime cultivated, or several removes from a wild state, though still a mazzard, the seedlings will show great variety of character.

"Once in the possession of a *variety* which has *moved out* of the natural into a more domesticated form, we have in our hands the best material for the improving process. The fixed original habit of the species is broken in upon, and this variety which we have created, has always afterwards some tendency to make further departures from the original form. It is true that all or most of its seedlings will still retain a likeness to the parent, but a few will differ in some respects, and it is by seizing upon those which show symptoms of variation, that the improver of vegetable races founds his hopes."

While a few of the seedlings from such improved variety, may become still further improved, a far greater number will probably approach towards the original or wild state. The more highly improved the fruit, the greater the difficulty to find one of its progeny which shall excel or equal the parent. In ten thousand seedlings from those high-flavored apples, the Swaar and Esopus Spitzenburgh, it may be quite doubtful if any shall equal in quality those fruits themselves, while most may fall considerably below them.

The improvements effected in former ages were doubtless the result of accident, as the ancients were ignorant of the means for their systematic accomplishment. The greatest progress in the art made in modern times, was effected by Van Mons in Belgium, and Knight in England.

Van Mons, who directed his labors chiefly to the pear, produced many new and excellent varieties, by a constant and successive selection of the best seedlings. He first made a large collection of natural stocks, or wild pears, choosing those which, from the appearance of the wood and leaf, he had reason to believe, would be most likely to produce the best fruit. As soon as the first of these bore, he selected the best, and planted the seeds. Selections were again made, from the first, of these, and so on in continued succession; the best and soonest in bearing were uniformly chosen. He thus obtained fruit from the eighth generation; each successive experiment yielding an improved result on the preceding. At the fourth generation many of the fruits were good, several excellent, but a smaller number still bad. He had, in the early part of this series of experiments, no less than eighty thousand trees; hence in selecting from so large a number, his chance for fine sorts was far greater than from a small collection; and hence too the reason why, after seven or eight improving generations, he had obtained so many good varieties. In the early stages of his operations, he found "that twelve or fifteen years was the mean term of time, from the moment of planting the first seed of an ancient variety of the domestic pear, to the first fructification of the trees which sprung from them. The trees from the second sowing, yielded their first fruit at an age of from ten to twelve years; those of the third generation, at an age of from eight to ten years; those of the fourth generation, at an age of from six to eight; and those of the fifth generation at the age of six years. Van Mons, being actually at the eighth generation, has informed me that he has obtained several pear trees which *fruited at the age of four years.*"* When his seedlings were at the age of three or four years, he was able to judge of their appearances, though they had not as yet borne; such only were taken for further trial, as enhibited the strongest probability of excellence. It is hardly necessary to remark that in all these trials, the young trees were kept in the highest state of cultivation.

Van Mons maintained that by selecting and planting the seeds of the first crop on the young tree, the product would be less liable to run back to the original variety, than where

* Poiteau.

the seeds were taken from the fruit of an old bearing or grafted tree; and to this practice he chiefly ascribed his success. The many instances, however, of fine seedlings from old grafted sorts, throw a shade of doubt over this theory.

NEW VARIETIES BY CROSSING.

A familiar instance of cross-impregnation in plants occurs in the Indian corn. The pistillate or seed-bearing flowers covering the young ear, are remotely situated on the plant from the staminate or fertilizing flowers on the summits or *tassels*. Hence, from this remote position, the pollen or fertilizing dust from the summits may not certainly fall on the ear; and if different sorts grow near, a mixture will probably result. It is well known to farmers, that if different sorts, as white, yellow, and purple, are planted in the same field; or, if common and sweet corn are planted together, each sort no longer remains distinct, but each ear the second year is speckled with a promiscuous assemblage of white, yellow, and purple, and of common and sweet corn, of various grades. In fruit trees, the stamens and pistils are in the same flower, and the chances of accidental mixture from other trees, become very small, unless affected by insects, which, becoming thickly dusted with powder from one flower, plunge into the recesses of another, and effect a cross-fertilization. Where many varieties grow in one garden, in close proximity, cases of promiscuous intermixture are constantly occurring, which can be developed only by raising fruit from the seedlings.

In the annexed figure of the pear blossom, (fig. 1,) the five central organs, *a*, are the *pistils*; the upper extremity of each is the *stigma*. The surrounding thread-like organs, *b*, are the *stamens*, surmounted by the *anthers*. The anthers are little bags or cases filled with the pollen or fertilizing dust. When the flowers open, the anthers burst, and discharge the pollen on the stigma, which operates on the embryo fruit at its base.

Fig. 1.

The production of new varieties is greatly facilitated by cross-impregnation, or by fertilizing the pistil of one variety with the pollen of another. This was performed with great

success by Knight. Selecting two varieties, while yet early in flower, and before the anthers had burst and discharged the pollen, he cut out with a fine pair of scissors all the stamens, leaving the pistils untouched, (fig. 2.) When the stigma became sufficiently mature, which was indicated by its glutinous surface, he transferred the pollen of the other sort, on the point of a camel's-hair pencil. The fruit, thus yielded, was unchanged; but its *seeds* partook variously of the nature of both parents, and the trees growing from them bore new and intermediate varieties.

Fig. 2

For the success of such experiments, several precautions are requisite. The flower must be deprived of its stamens before it has fully expanded, or before the anthers have already burst and scattered their dust; the pollen must be procured from a bursting or fully matured anther, when it will be dry and powdery; the stigma must be inoculated as soon as it becomes adhesive or glutinous, otherwise it may be fertilized from another source, and then the intended pollen cannot possibly take effect. For a stigma once inoculated, cannot be inoculated again. It is safest, where practicable, to force the trees by artificial heat into flowering a few days earlier than others, so as to be secure from accidental inoculations of pollen floating in the air; and to prevent its spread by bees, to apply a temporary covering of gauze. A want of attention to these minutiæ, has led some experimenters to fancy they had obtained crosses, when they had only natural seedlings.*

To obtain new varieties of certain desired qualities, select two which possess those qualities separately, and seedlings from crossing will be likely to exhibit these qualities combined. Thus, a very early pear deficient in flavor, as the Amire Joannet, might furnish one of superior quality by a cross with a better and later sort, as Dearborn's Seedling. Or, a small and very rich pear, as the Seckel, might give us one of the larger size by fertilizing the Bartlett. A slow-growing and tender peach, as the Early Anne, might be rendered hardier and more vigorous by an intermixture with

* Pollen may be kept without injury for months, if sealed air-tight in a small vial.

the Early York or Cooledge's Favorite. But it must be remembered, that there is a tendency in such highly improved sorts to deteriorate, and that out of a large number of seedlings, perhaps only one or two may be equal in flavor to the original.

Some of our best fruits have resulted from artificial crossing. Coe's Golden Drop plum was obtained by planting seed of the Green Gage, impregnated with pollen from the White Magnum Bonum; the Elton cherry, from the Graffion or Bigarreau, fertilized with the White Heart; and Knight's Early Black and Waterloo, from the Mayduke and Graffion.

The first crop of a young seedling is not always sufficiently developed to exhibit its true character. Some years of bearing are often essential. Thus, the Black Eagle, one of the finest cherries, when exhibited the first time before the London Horticultural Society, was pronounced worthless.

When a cross is obtained between two different *species*, instead of between mere varieties, it is termed a *hybrid*. But while varieties of the same species intermingle freely, the operation rarely succeeds between fruits of different species. The gooseberry, currant, and black currant, species of the same genus, and nearly related, have never produced a hybrid. Neither have any ever been obtained between the apple and the pear, or the pear and the quince. But different species of other plants, as the Heaths, and some of the Cacti, intermingle freely. The Rhododendron will fertilize the Azaleas, and the Red Cedar has been made to inoculate the American Arbor-vitæ, though both these examples are between plants of different genera. Hybrids are frequently sterile; or if they possess the power of reproduction by seed, the progeny returns to the state of one or the other of its parents.

CHAPTER IV.

PROPAGATION BY BUDDING AND GRAFTING BY LAYERS AND BY CUTTINGS.

When trees are raised from seeds, as before stated, there is no certainty that the same identical variety will be reproduced. In many cases, the shade of variation will be scarcely perceptible; in others it will be wide and distinct. It hence becomes desirable in preventing a return towards the original wild state, or, in other words, to perpetuate the identical individual thus highly improved, to adopt some other mode of propagation, for the purpose of multiplying trees of such varieties as possess a high excellence, instead of constantly creating new ones, with the hazard of most of them proving worthless.

It will be distinctly remembered, that new varieties must always spring from seeds; but the same individual variety can be multiplied only by separating the buds, or shoots bearing the buds, of such individual plant. As an example, the Fall Pippin, when first produced from seed, was a single tree of a new variety. The myriads of trees now existing of this variety, are only multiplications of the branches of the original. This multiplication or propagation of varieties, is effected in several ways: 1, Cuttings; 2, Layers; 3, Grafting; 4, Budding. Without these means of propagation, such delicious sorts as the Green Gage plum, the Elton cherry, and the Seckel pear, could never have been tasted except as picked from the single parent tree.

In the multitude of different modes of grafting and budding, success must depend on the observance of certain fundamental principles; a brief glance, therefore, at these principles, may serve to render the explanation of all the variations simple and intelligible.

During the growing season of a fruit tree, the sap enters at

the spongioles, or minute spongy extremities of the fibrous roots,* at which time it consists merely of water, with minute portions of other substances in solution. It passes up through the alburnum or sap-wood, dissolving mucilage in its progress; it becomes further charged in a very slight degree, and acquires a saccharine character. It ascends to the extremities of the branches, and is distributed through the leaves. Emerging thus from the dark and minute vessels of the wood, it is spread out and exposed to the action of the light, by means of the fine web or net-work of veins running from the mid-rib to all parts of these broad and thin organs. Here it becomes essentially changed in character, it enters into new combinations, and is charged with the materials for the newly forming wood; it now descends, not through the sap-wood, but through the inner or living bark,† and deposits a new layer between the bark and the wood. This new layer being soft and fresh, interposed between them, causes that separation known as the *peeling* of the bark.‡

Fig. 3.

The sap is capable of flowing sidewise, through lateral openings in the vessels or microscopic tubes. Hence some trees may be cut at one point more than half through on one side, and at another point more than half through on the other side, without intercepting the upward flow of sap, as in fig. 3. This lateral motion explains the reason why a graft set in the longitudinal cleft of a stock, receives the sap from the split surfaces of the cleft, and succeeds as well as when cross-sections of both are brought into contact.

* A greatly magnified representation of one of these spongelets is shown in the annexed figure, (fig. 4,) the central or dark part being woody, and the point of the exterior being cellular and spongy.

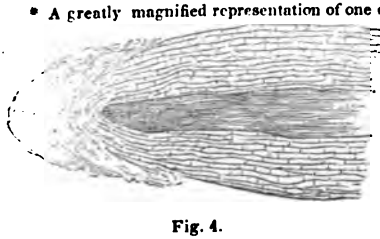


Fig. 4.

† The *liber*, or inner bark, constitutes almost the whole bark in young trees, but often not one-half on very old and rough-barked forest trees.

‡ The importance of leaves to the growth and even life of the tree, is exhibited in various ways. A tree stripped of its leaves at midsummer, instantly ceases growing. A succession of such strippings, during the course of the season, soon

I. CUTTINGS.

When a ligature is bound closely round a branch, the obstruction which it imposes to the descending juices, causes an enlargement or swollen ring above the ligature, as in fig. 5. The same result is produced if a small ring of bark is cut out, as in fig. 6. If a shoot is taken from the tree before the leaves expand, and plunged into moist earth till it commences growth, the descending current exuding from the lower extremity, forms a *callus* or ring of the newly formed wood, as in fig. 7; and under favorable circumstances the granulations forming the callus emit roots into the soil, (fig. 8,) and thus a new plant is formed.

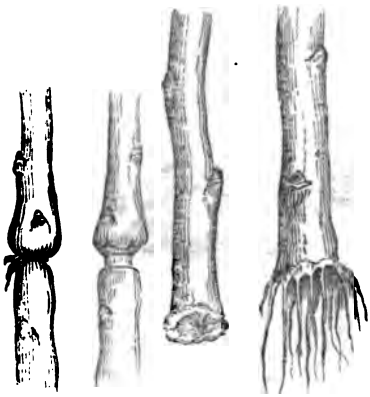


Fig. 5. Fig. 6. Fig. 7. Fig. 8.

Every leaf bud on a fruit tree may be regarded as an embryo branch, and capable of forming a tree when supplied

kills it. Weeds which spread rapidly by the roots, as the Canada thistle, may be totally destroyed in one summer, if constantly kept cut off below the surface.

For the same reason, trees which become divested of their foliage by *leaf-blight* while the fruit is partly grown, do not perfect the ripening process. An interesting instance occurred during the past season :—A plum tree lost all its leaves, when the fruit was about two-thirds grown, and before it had attained in the slightest degree its flavor. The plums remained stationary, densely loading the naked branches, for three weeks, when a new crop of leaves came out. The fruit immediately recommenced growing, and subsequently acquired full size, and a fine, rich, honied flavor, about a month later than the usual period of ripening.

Hence also the reason why the removal of large portions of the foliage, to favor the ripening of grapes and other fruits by admitting the sun, does not always effect the intended purpose.

Another case, illustrating the same principle, was reported by the late President Knight :—"A peach tree in my garden, of which I was very anxious to see the fruit, had lost by the severity of the weather, all its blossoms except two, which grew upon *leafless branches*. I therefore endevored to derive the necessary returning sap [to mature the fruit] from another source. To attain this object, the points of the branches, which bore fruit, were brought into contact with other branches of the same age, which bore leaves; and a part of the bark, extending in length about four times their diameters, was pared off immediately above the fruit. Similar wounds were then made upon the other branches, with which these were brought into contact; the wounded surfaces were closely fitted and tightly bound together. A union soon took place, and the fruit, in consequence, acquired the highest state of maturity and perfection."

with separate roots. But single buds do not contain within themselves sufficient nutriment to sustain vegetation till roots are formed, without a considerable portion of the alburnum or sap-wood attached; hence the superior advantage of taking an entire shoot or cutting.

Propagation by cuttings is the simplest mode of multiplying a variety. It consists simply in the insertion of a shoot of one year's growth into the soil; the moisture of the soil renews the supply of sap, the buds swell, the leaves expand, and the descending juices expend themselves in the production of new roots, which shoot downwards into the soil, fig. 9. Under ordinary circumstances, or in open ground, this mode is only applicable to such species as readily throw out roots, as the currant, gooseberry, quince, and grape. Cuttings of the apple and pear may be made to strike root, only by confining the moisture under glass, while artificial heat is applied. The stories of empirics, of making peach and apple shoots grow by sticking them into potatoes, or covering with wax, have no foundation in fact.

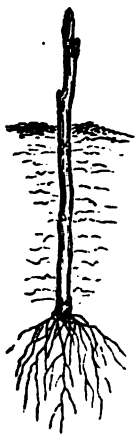


Fig. 9.

It may be stated, in general, that cuttings made of the ripened wood of such trees as have a large pith, succeed best when taken off with a portion of the preceding year's wood, such as the gooseberry, currant, vine, fig, &c. With large and strong shoots, the best success will result if cuttings are separated at the point between the one and two years' growth. When small side-shoots are used, they should be cut closely to the main stem, so as to secure the *collar* or enlarged portion of the wood at the base of the branch. Roots are more readily thrown out, if the cut is made immediately below a bud.

The best time to take off cuttings, in ordinary cases, is in autumn and winter. The autumn is preferable, by giving time for the wounded section to cicatrise, preparing it for the early emission of roots in spring. But where the soil is heavy or liable to heave by frost, or where the cuttings are of tender trees, they should be kept in damp mould in a cellar, to be planted as soon as the frost disappears from the

ground. If not taken off till spring, the operation must be performed as early as possible. In ordinary instances to prevent drying, about two-thirds or three-quarters of the shoot should be buried beneath the surface ; and the moisture may be still further retained by a covering of leaves or moss, or by placing them under the shade of a wall or close fence. Failure often results from a neglect to press the soil closely about the cutting.

Fig. 10.

To procure young plants of the gooseberry and currant with straight, clean stems at the surface, and free from suckers, it is only necessary to remove every bud except a few at the upper end, fig. 10. The length may be eight inches to a foot.

In propagating the grape, scarce sorts are increased by single buds with a portion of adhering wood, each being placed separately in a pot, about half an inch deep, under glass in a hot-bed, fig. 11. They are found to root better when a portion of the pith is removed by splitting lengthwise, as in fig. 12. The plants from single buds are weaker in growth, but are usually better rooted for raising vines in pots. A similar mode of propagation, familiar to all, is adopted with the potato, the tubers of which are only enlarged underground stems, covered with eyes or buds.

Fig. 11.

Fig. 12.

II. LAYERS.

A layer is a low side-shoot bent down and buried at the middle in the soil, fig. 13. The buried portion strikes root, when it is taken off and planted separately. Its advantage over a cutting, is that it is nourished while the roots are forming by the parent plant. Hence many plants which cannot be increased by cut-

Fig. 13.

tings, and indeed with great difficulty by budding and grafting, may be propagated readily by layers.

When roots are freely emitted, as from the grape, simply bending the middle of the branch into the soil is enough to ensure success. But in cases of difficulty, other expedients are resorted to; one of the most common is to split a portion upwards, immediately under a bud, (fig. 14,) which enables the newly forming roots to pass freely and at once into the soil, without the resistance of the thick bark which they otherwise must pierce. Sometimes the branch is cut partly off to intercept the downward passage of the fluids, and induce them to form into roots. At other times a wire ligature, or the removal of a narrow ring of bark effects the same purpose. Burying the layer several inches under the surface is necessary, to keep it in moist earth; and in drouth, moderate watering would be beneficial. A small excavation of the soil at the spot is convenient; and when the branch is stiff, it must be fastened down with a forked stick.

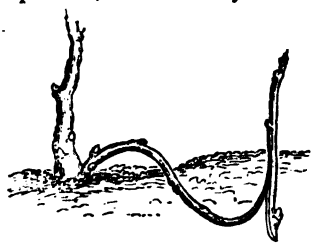


Fig. 14.

The excavation should be made with a spade. Use both hands in bending the shoot, so that it may not be bent too short, and break. If properly done, it will press against the *nearest* side of the hole, rest on the bottom, and rise up, pressing against the opposite side, when it should be fastened *upright*, and if necessary, to a small stake. At the time of bending, a sod or other weight may be laid on to keep it down till the hole is filled; and if the mellow earth be pressed firmly down with the foot, no forked stick will be usually necessary.

The most favorable state of a plant for layering, is when the bark is somewhat soft and not too ripe; and the worst shoots are those which are stunted, and with a hard bark. There are however, no shoots whatever, not actually diseased, that will not root by layers, if sufficient time be given. Layers, like cuttings, may be made of the ripened wood in autumn or spring; or of the growing wood at or a little be-

fore mid-summer, when the part intended to root is somewhat mature and firm in texture. The pear, the apple, and the quince, if layered early in the spring; or the grape in summer—will usually be well rooted in autumn.

A moist season is the most favorable to the rooting of layers, by preserving a softer bark. For this reason, many plants may be more easily propagated in England than in the United States; and more readily in Ireland than in England.

Layering is largely made use of in propagating the grape, occasionally for the quince, and sometimes for the apple. It is also of very extensive application in propagating many ornamental trees and shrubs.

Suckers may be regarded as spontaneous layers, the new shoots being sent up from buds on the roots or portions of the stem beneath the surface of the ground. They are the only mode of multiplying most species of the raspberry. The runners of strawberries may be regarded as layers or suckers above ground.

III. GRAFTING.

Upwards of twenty different modifications of grafting were mentioned by the ancient Roman writer, Varro; and Thouin, of Paris, has described and figured more than a hundred kinds. The great number of modes described in books, has tended rather to bewilder than to enlighten beginners; the following remarks, therefore, are more for the purpose of laying down *reasons* on which success depends, than for pointing out the peculiar modes of operation, which may be varied according to convenience, provided attention is given to the essential particulars.

Propagation by grafting differs mainly and essentially from increasing by cuttings, by inserting the cutting into the growing stock of another tree instead of directly into the soil. The stock thus supplies the sap, as the soil does in the case of a cutting; and the graft, instead of making roots of its own, extends its forming wood downwards, at the inner surface of the bark, into the stock itself. Hence there are two chief requisites for success: the first, that the graft be so set in the stock, that the sap may flow upward without interruption; and the second, that the forming wood

may flow downward uninterruptedly through the inner bark. To effect these two requisites, it is needful, *first*, that the operation be performed with a sharp knife, that the vessels and pores may be cut smoothly and evenly, and the two parts be brought into immediate and even contact. *Secondly*, that the operation be so contrived that a permanent and considerable pressure be applied to keep all parts of these cut faces closely together. *Thirdly*, that the line of division between the inner bark and the wood, should coincide or exactly correspond in each; for if the inner bark of the one sets wholly on the wood of the other, the upward current through the wood and back through the bark, is broken, and the graft cannot flourish nor grow. And, *fourthly*, that the wounded parts made by the operation, be effectually excluded from the external air, chiefly to retain a due quantity of moisture in the graft, but also to exclude the wet, until, by the growth of the graft, the union is effected.

1. The first requisite is best attained by keeping a keen, flat bladed-knife to cut the faces, and another knife for other purposes.

2. The second requires that the jaws of the stock in cleft-grafting, press with some force, but not too much against, the wedge-shaped sides of the graft. A stock one-third of an inch in diameter will sometimes do this sufficiently; but three-quarters of an inch is a more convenient size. In whip-grafting, the tongue and slit should be firmly crowded or bound together.

3. The third requisite is attained by close examination with the eye.

4. The fourth is accomplished by plasters of grafting-wax or by the application of grafting-clay. Grafting-wax may be made by melting together rosin, tallow, and beeswax, in such proportions as to admit of being easily applied when softened by warmth, but not liable to melt and run in the sun's rays. An excellent grafting-wax is made of 3 parts of rosin, 3 of beeswax, and 2 of tallow. A cheaper composition, but more liable to adhere to the hands, is made of 4 parts of rosin, 2 of tallow, and 1 of beeswax. But one of the best and cheapest consists of 1 pint of linseed oil, 1 pound of rosin, and 6 pounds of beeswax. These ingredients, after being melted and mixed together, may be ap-

plied in different ways. The wax may be directly applied when just warm enough to run, by means of a brush; or it may be spread thickly with a brush over sheets of muslin, or thin, tough paper, ("post-office paper" is best,) which are afterwards, during a cold day, cut up into plasters of convenient size for applying; or, the wax, after cold, may be worked up, with wet hands, and drawn out into thin strips or ribbons of wax, and wrapped closely around the inserted graft. In all cases success is more certain, when the wax is closely pressed so as to fit closely to every part, and leave no interstices; and it is indispensible that every portion of the wound on the stock and graft be totally excluded from the external air. In cool weather, a lantern, chafing dish, or hot brick, will be found necessary to soften the plasters before applying them.

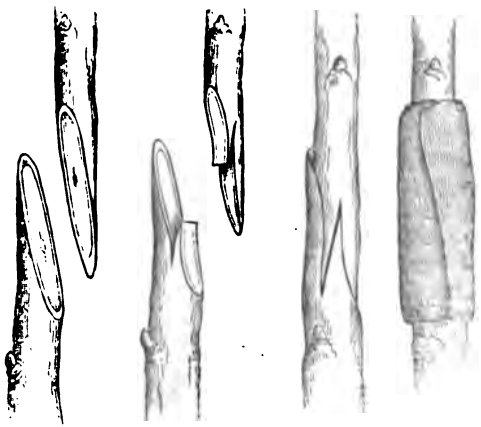


Fig. 15. Fig. 16 Fig. 17. Fig. 18.

The annexed figures represent the two most common modes of grafting fruit trees; figs. 15 to 18, representing successive stages of *whip or tongue grafting*, from the sloping cut of the scion and stock, to the completion of the operation by the covering with the wax plaster. Fig. 19 shows a stock cut off for cleft-grafting with the upright cleft separated by an iron or steel wedge, ready for the graft; fig. 20, cut wedge-form to fit it; and fig. 21, the graft in its place

after the wedge has been withdrawn, the projecting angle of the stock sloped off with a knife, and the whole ready for the application of the wax.

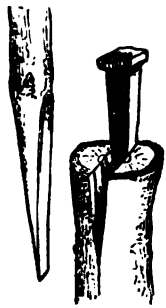


Fig. 20. Fig. 19.

Fig. 21.

Whip grafting is particularly applicable to small stocks, or where the graft and stock are nearly of equal size; and cleft-grafting to stocks considerably larger than the scion. In all cases, where the stock is in any degree larger, the graft must be placed towards one side, so that the line between the bark and wood may exactly coincide at one point at least in both, as in the cross section of cleft-grafting, fig. 22. A useful implement for the rapid and perfect performance of cleft-grafting, is described in the chapter on implements.

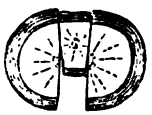


Fig. 22

There are other modifications of grafting which are often useful. In *saddle grafting*, the stock is sloped off on each side, giving it the form of a wedge, fig. 23, *a*; the graft is split in the middle, and each side thinned away with the knife, as in fig. 23 *b*, until it will closely fit when placed like a saddle upon it, fig. 24. The most perfect way to fit the graft, is to make a long sloping cut from the outer edge or bark, by drawing the blade from heel to point, till it reaches the centre of the graft; and then another similar cut completes the acute cavity for fitting the wedge of the stock. A sharp, broad, and thin blade, is needed for this operation. A wax plaster, drawn closely round the place of union, completes the work. When the stock and graft are very nearly of equal size, this is a very perfect mode of

Fig. 23.

Fig. 24

Fig. 25.

grafting, as large corresponding surfaces are made to fit, and the graft receives freely the ascending sap.

In all these modes of grafting, whenever a wedge is made to enter a cleft, it should be thickest on the side where the fit is made between the two parts, so as to receive the full pressure of the cut faces at that side, as shown in fig. 22.

A modification of saddle grafting, very successful in its results, is thus performed:—Late in spring, after growth has commenced, the scion, which is much smaller than the stock, is split up, nearer to one side, more than half its length, (fig. 25.) The stronger side is then sharpened into a wedge at its point, and introduced between the bark and the wood, a slight longitudinal slit being made through the bark of the stock, that it may open slightly and admit the graft. The thinner division of the graft is fitted to the opposite sloping side of the stock. The whole is then covered with wax. The great length of that portion of the graft in contact with the bark and fresh wood, greatly facilitates their union; while the cut face of the stock is speedily covered with a new growth by that part of the graft which rests upon it.

In grafting the peach, which, from its large pith and spongy wood, scarcely ever succeeds as commonly performed, it is found advantageous in selecting the grafts, to leave a quarter of an inch of the more compact two years' wood at the lower extremity.

Root-grafting is performed by taking up the stocks by the roots, and inserting the grafts immediately into the part below ground after the tops are cut off, after which they are again planted out, with the tip of the graft only above ground. This mode is successful with the apple, and occasionally with other trees, and is adopted on a large scale by many nurserymen, the work being performed in winter or early spring within doors, and the grafted roots kept in cellars till the ground is ready to receive them. It will be found fully described in the chapter on the apple.

In grafting the plum and cherry, success is found to be much more certain, when the work is performed very early

in spring, before the buds commence swelling, or even before the snow has disappeared from the ground. Apples and pears may be grafted later, and if the scions have been kept in good condition in a dormant state, they will mostly grow if inserted after the trees are in leaf.

After a graft is inserted, and as soon as the tree commences growth, the buds on the stock must be rubbed off, in order to throw the rising sap into the scion. If large trees are grafted, the buds need only rubbing off the single branch. The practice of allowing leaves to expand on the stock near the point of union, to "draw up the sap," appears to be founded in error; for the sap thus drawn up, passes only into and is elaborated by those leaves, and is again immediately returned to the stock below, without ever reaching the graft. Each separate branch or portion of the stock, cannot be nourished by the leaves of an opposite branch, for a leafless stump left by pruning off a limb, wholly ceases growing. In the spring of the year, when the sap vessels are in a state of impletion, if the sap is permitted to be consumed by side leaves, less will flow towards the inserted scion. Experience fully confirms this view of the subject.

Where it becomes desirable to preserve rare sorts, which have been grafted late in spring, a loose wrapper of white paper round the graft will protect it from the drying and scorching rays of the sun; or shrivelling and failure will often be prevented by covering the whole graft with a wax plaster; or by encasing it in moss kept damp by occasional applications of water.

Grafts are usually cut during the latter part of winter or early in spring; but if well kept they may be taken from the tree at any time between the cessation of growth in late summer or autumn, and the commencement of vegetation in spring. They may be kept safely if buried in moderately moist earth; the best way is to place them in a box open downwards, and buried on a dry spot, the scions being kept from actual contact with the earth by sticks across the box. They may also be conveniently preserved in a box of damp powdered moss; or still better in moderately moist peat or black muck. Sawdust answers the same purpose, if not in large quantities so as to become heated.

Grafts which have become dry, may be restored if the moisture is applied so gradually that its absorption may require several weeks. In one instance shoots cut early in autumn, and subjected to thorough drying, were restored to perfect freshness by the next spring, by wrapping them well in moss and burying them in a dry spot of ground; and being set, they all grew.

Scions for sending to a distance, are usually packed in damp moss, saw-dust, or fibrous peat. They may be sent by mail, within a very small compass, with great safety, by enwrapping them with oil-silk or thin oil-cloth, drawing it closely round them to exclude the moisture, by means of small thread.

IV. BUDDING.

Budding consists in introducing the bud of one tree, with a portion of bark and a little adhering wood, beneath the bark of another, and upon the face of the newly forming wood. It must be performed while the stock is in a state of vigorous growth. An incision is made lengthwise through the bark of the stock, and a small cut at right angles at the top, the whole somewhat resembling the letter T., fig. 26

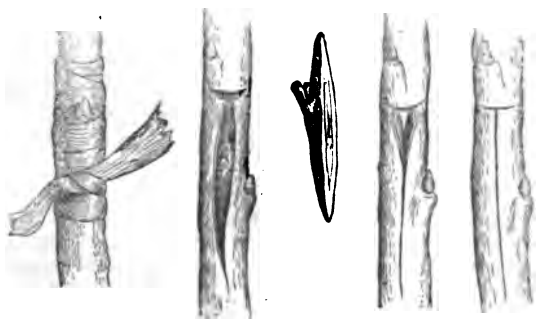


Fig. 30. Fig 29. Fig. 27. Fig. 28. Fig. 26.

A bud is then taken from a shoot of the present year's growth, by shaving off the bark an inch or an inch and a half in length, with a small part of the wood directly beneath the bud, fig. 27. The edges of the bark, at the incision in the stock, are then raised a little, fig. 28, and the

bud pushed downwards under the bark, fig. 29. A bandage of bass, corn-husk, or other substance, is wrapped round, covering all parts but the bud. The pressure should be just sufficient to keep the inserted portion closely to the stock, but not such as to bruise or crush the bark, fig. 30.

The shoots containing the buds should be cut when so mature as to be rather firm and hard in texture; they are usually in the best condition after the terminal bud has formed. To prevent withering, the leaves must be immediately cut off, as they withdraw and exhale rapidly the moisture from the shoot; about one quarter of an inch of the footstalks of the leaves should remain, to serve as handles to the buds while inserting them, fig. 31. After being thus divested of leaves, they may be safely kept a week in a cool damp place, or sent hundreds of miles in damp moss, or encased separately in thin oil-cloth.

Fig. 31.

When by growth, the bandage cuts into the stock, usually in ten days to three weeks, it must be removed. The bud remains dormant till the following spring, when the stock is cut off two inches or more above it. If cut closer, the end of the stock becomes too dry, and the bud often perishes. All other buds must be then removed, and all the vigor of the stock or branch thrown into the remaining bud, which immediately commences a rapid growth.

To secure a straight and erect growth, the new shoot, when a few inches long, is tied to the remaining stump of the stock, fig 32. By another month, no further support will be needed, and the stump may be wholly cut away, and the wound allowed to heal by the rapid formation of new wood.

Buds inserted by midsummer, may be made to grow the same season by heading down the stock when adhesion has taken place; but although often attempted, no advantage has resulted from this practice, as the growth is comparatively feeble, and in consequence of its badly matured wood, often perishes the following winter. Even where it escapes, it does not exceed in size at the close of the second season the straight and vigorous shoots of the spring.

The essential requisites for success in budding, are *first*, a thrifty, rapidly growing stock, so that the bark will peel very freely. *Secondly*, a proper time; not too early, when there is little cambium, or mucilaginous cement between the bark and the wood, for the adhesion of the bud,—nor too late, when the bark will not peel freely, nor the subsequent growth sufficiently cement the bud to the stock. *Thirdly*, buds sufficiently mature. *Fourthly*, a keen flat knife, for shaving off the bud, that it may lie close in contact upon the wood of the stock. *Fifthly*, the application of a ligature with moderate pressure, causing the bud to fit the stock closely.

Fig. 32.

Various modifications have been proposed for the improvement of budding. One is to make the cross-cut at the bottom of the long slit instead of at the top, as the latter is supposed to impede the descent of nourishment. Another is, to raise the bark all on one side of the slit, making a small notch in its edge for the bud, this mode being supposed to avoid the bad consequences of the mutilation of the wood by the knife. But these modes are both inconvenient, and are found to possess no advantage in practice; the supposed evils they are intended to obviate being too small to take into account. Making a square cut from the upper end of the bark of the inserted bud, so that it may fit in close contact with the bark of the stock at the horizontal incision, to receive the returning sap, though strongly recommended, has been found of no utility in practice, as the union takes place wholly between the two faces in contact.

The English practice of taking out the small portion of wood cut from the shoot, has been found in the climate of this country not only useless, but really detrimental. Indeed it often happens that buds of the cherry and other trees of rather spongy growth and slow adhesion, succeed much better when a thick portion of wood is taken off with the bud than otherwise; the wood in such cases assisting in the retention of moisture until cemented to the stock.

When stocks are in the best condition, it is unnecessary to raise the bark any further than to admit the lower point of the bud, which, as it is pushed downwards, performs this operation in the most perfect manner. When the bark does not peel freely enough for this purpose, success becomes very uncertain.

Budding is performed in summer, grafting in spring, and both have their advantages. Budding is a simpler operation, and more successfully performed by a novice. It is the best means to multiply the peach and nectarine, grafting very rarely proving successful. It is more rapidly performed, and at a season not crowded with the labors of transplanting. It admits a repetition the same summer, in cases of failure, the stocks remaining uninjured. But in all cases thrifty stocks are needed, while grafting will succeed on those older and less vigorous. Grafting requires less care subsequently, as no ligatures need removing, nor stocks heading down, and may be conveniently employed as a remedy for failures in the previous summer's budding. In England, where most fruit trees do not make so rapid a growth as here, budding is less esteemed; while from the moisture of the climate preserving grafts from dying, grafting becomes more successful.

Terminal Budding.—It sometimes happens, where buds are scarce, that the terminal bud on the shoot may be used to advantage. In this case, the wood is cut sloping downwards, and the insertion is made as usual, fig. 33, except that it becomes necessary to apply the whole of the ligature below the bud. The buds on small side shoots which are not more than an inch or two long, may be successfully used in this way, as the terminal eyes are stronger than any of the others. This practice may sometimes be adopted with much advantage with the peach, where scions of feeble growth only can be obtained, as such buds usually escape the severity of winter when most of the others are destroyed.

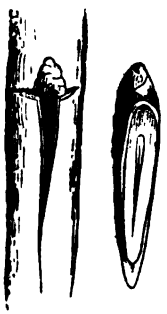


Fig. 33.

Spring budding is successfully practiced as soon as trees are in leaf, the buds hav-

ing been kept dormant in an ice-house or cool cellar. As soon as they have adhered, the stock is headed down, and a good growth is made the same season. Peaches, nectarines, apricots, and the mulberry, all very difficult to propagate by grafting, may in this way be easily increased by budding. If the buds are kept in a cellar, it will be found very important to preserve with them as uniform a degree of moisture as possible, and in as small a degree as will keep them from wilting.

Annular budding is applicable to trees of hard wood, or thick or rigid bark, as the walnut, and magnolia. A ring of bark is removed from the stock, and another corresponding ring, containing the bud, slit open on one side, is made to fit the denuded space. Fig. 34.

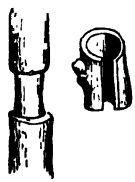


Fig. 34.

Trees which have been girdled in winter by mice, may be preserved by a process similar to annular budding, by cutting away evenly the gnawed portions, and applying one or more pieces of bark peeled from the branch of another tree, so as to restore the connection between the two severed portions. This is done as soon as the bark will separate the same end may, however, be accomplished early in spring by cutting away portions of the sap-wood with the bark, and connecting the two parts by several pieces of a branch, care being taken that they coincide accurately, as in grafting The whole, in either case, is then covered with wax.

LIMITS OF BUDDING AND GRAFTING.

In former ages of the world, it was erroneously supposed that grafting could be performed between every species of tree and shrub. "Some apples," says Pliny, "are so red that they resemble blood, which is caused by their being at first grafted upon a mulberry stock." Roses, it was said, became black when grafted on black currants, and oranges crimson if worked on the pomegranate. But the operation is never successful unless the graft and stock are nearly allied, and the greater the affinity the more certain the success. "Varieties of the same species unite most freely, then species of the same genus, then genera of the same natural order; beyond which the power does not extend. For instance, pears work freely upon pears, very well on quinces,

less willingly on apples or thorns, and not at all upon plums or cherries; while the lilac will take on the ash, and the olive on the phillyrea, because they are plants of the same natural order. M. De Candolle even says that he has succeeded, notwithstanding the great difference in their vegetation, to work the lilac on the phillyrea, the olive on the ash, and the Bignonia radicans on the Catalpa (in all cases of the same natural order;) but plants so obtained are very short-lived."*

There are, however, some exceptions to this rule. Thus, the cultivated cherry, and most species of wild cherry, though of the same genus, will not agree. The pear succeeds better on the quince than on the apple, although the apple and pear are within the same genus, and the pear and quince are by most regarded as of distinct genera; the superior firmness of the wood of the quince, a quality so important to successful grafting, more than making up the difference in affinity.

Lindley mentions also some exceptions which are apparent only. In one case, the fig was supposed to grow on the olive. But the graft, being below the surface of the soil, rooted in it, independently of the fig stock. "I have seen," says Pliny, "near Thulia, in the country of the Tiburtines, a tree grafted and laden with all manner of fruits, one bough bearing nuts, another berries; here hung grapes, there figs; in one part you might see pears, in another pomegranates; and to conclude, there is no kind of apple or other fruit but there was to be found; but this tree did not live long." This is explained by the process now sometimes performed in Italy, for growing jasmines and other flexible plants, on an orange stock, by the ingenious trick of boring out the orange stem, through which the stems of the other plants are made to pass, and which soon grow so as to fill it closely, and to appear as if growing together. Such a crowded mass of stems must, of course, soon perish.

THE BEST KINDS OF STOCKS.

As a general rule, fruit trees succeed best when grafted on seedlings of their own species. Apples are best upon seedling apple stocks; pears on seedling pears; and plums

* Lindley, Theory Hort.

and cherries on seedling stocks of their own kinds respectively. Suckers, when their roots diverge evenly on all sides, sometimes make good stocks; but the uncertainty of finding such roots, and the inconvenience of crooked, one-sided, or stunted trees, so often produced from suckers, renders them on the whole greatly inferior to seedlings, and they should never be used, except from absolute necessity.

In some cases, stocks of a different kind from the graft are chosen, where certain objects are to be attained. When, for instance, dwarf trees are wanted of the apple and pear, that they may cover less ground, or bear sooner, stocks of smaller size or of diminished growth, are chosen. The quince is used for dwarf pear trees; the small paradise and the Doucin or French stock, for dwarf apples. These will bear crops in one-half the usual time. Besides increasing the early productiveness of some varieties, the quality too is changed and sometimes improved, as in the Angoul·me and Beurré Diel pears.

Sometimes different stocks are used as a protection from the attacks of insects. For example, the peach and apricot, which are very liable to attacks of the *peach-worm*, are budded upon the plum, which very seldom suffers. The quince is often destroyed or injured by the *borer*, but the pear is exempt from this injury; hence the former may be grafted on the latter. But such expedients sometimes fail. Instances have been observed where the peach-worm, not to be thwarted in this way, had attacked the apricot at the place of union on the plum, even as high as three feet from the ground.

Tender kinds are sometimes placed upon hardy stocks with good effect. Thus, the peach budded on the plum has, in some instances, done better in cold climates, and made an earlier growth in spring. This is not to be ascribed to any alteration in the character of the peach, but to the simple fact that the plum is aroused by a less degree of warmth from winter's sleep, and exerts an earlier influence by its supply of sap.

Benefit has resulted from superior hardiness in stocks during wet or severe winters. The winter of 1846–7, accompanied in some parts of the country with unusual wetness, followed by intense cold, destroyed large quan-

tities of young pear trees on roots of their own species, while those on quince nearly all escaped.

Sometimes a change in the character of the soil renders certain stocks desirable for particular localities. The White Doyenné pear flourishes finely on the quince in some places where it is otherwise cracked and worthless. Dr. Lindley found that in the chalky soil at Rouen, the peach on plum, and cherry on cherry, were languid and sickly; while in the same garden, the peach was healthy and vigorous on the almond, and the cherry on the Mahaleb stock. But in rich artificial soil, composed of other ingredients, the two latter were again feeble in their turn.

CHAPTER V.

CHANGES WROUGHT IN FRUITS BY EXTERNAL CAUSES.

The importance of attention to the variation in fruit, wrought by a change in climate, soil, and cultivation, appears to be much underrated. While the peculiar or essential character of a variety remains unchanged, the quality, or degree of excellence, is variously modified. This is sometimes so great that serious disappointment results; and high expectations, caused by success in one case, are defeated by different circumstances in another. Hence the necessity of understanding these modifying influences.

The changes produced by *climate*, are greater in some classes of fruits than in others. The cherry varies but little in character and quality; the fine varieties originated by Thomas Andrew Knight near London, are also among the finest when removed to the northern states of America. This may be owing in part to their period of maturity, which, occurring early in summer, could not be influenced by the length of the seasons. But with the apple, pear, and peach, the case is quite otherwise. Very few of the whole British catalogue of apples, are first in quality here. The White Astracan, an apple of high reputation in Russia, becomes very inferior in England; and a similar loss takes place on the removal to England of some of the finest apples of Italy. Some of the best peaches in the neighborhood of Philadelphia, become second or third rate in western New York, the shorter and cooler summers of the latter region not being sufficient to give full flavor to many of the more southern varieties. American peaches taken to England lose still more. Of fifty sorts, from the middle and western states, tested at the great Chiswick garden, all but two were pronounced "worthless."

But the influence of seasons alone produces sometimes extraordinary results. In the year 1842, the Wurtemburg pear was regarded in western New York as the finest foreign pear among several which had then just fruited; but the two succeeding seasons it was nearly worthless. The Bezi de la Motte, about one year in seven, in some localities, is a delicious melting pear, and at other times dry and tasteless; in other localities, it is uniformly good. Some striking cases were mentioned by the late Robert Manning of Salem. The Beurré Duval, which has a high reputation in Europe, produced, the first year of bearing, beautiful fruit; but on ripening, they were found tasteless and worthless. The next year the same tree produced fewer pears, half the size, different in shade of color, and delicious in flavor. In another case the Hericart yielded fruit which proved melting and high-flavored. The next year it not only varied in size shape, and color, but was so tasteless as to be immediately rejected. Again, the Calabash pear produced in two seasons, oblong fruit with projecting ridges, the color being bright russett, and the flesh breaking, melting, and very good. The next year the fruit was more abundant, of larger size, of a bright yellow color, without ridges, and the flesh very insipid.* But these were unusual cases. They serve to show, however, the extreme caution to be used, both in describing fruit, and deciding upon the merits of new kinds. They also show the propriety of aiming to select such as are little affected by such influences, as the Madeleine, Bartlett, and Seckel.

It is this liability to change, and occasionally to become valueless, that has induced *the opinion that varieties are worn out by old age;* but this is disproved by the fact that the same varieties flourish elsewhere with undiminished excellence; and that some of the new sorts, when removed to ungenial localities also exhibit precisely the same symptoms of "running out" and decay.†

* Hovey's Magazine, vol. 8, p 87.

† The English Gold Pippin, which originated centuries ago, was long since cited as an example of an old and defunct variety; while even at the present day, in all favorable soils, both in Europe and America, it flourishes as well as ever. The Doyenné pear has been many years since, rejected in some parts of New England as worthless, where it once proved fine. But as proof that this deterioration is to be ascribed to some defect in the soil, and not to the age of the variety, it needs only to be stated that in central and western New-York, it is cultivated extensively and

INFLUENCE OF CULTURE.

The effect of keeping the soil mellow by repeated stirring, on most of the finer and delicious fruits, can be hardly believed by those who have only seen it on the more common varieties of the apple. "No stunted tree bears fine fruit Even the Seckel pear, of all sorts the highest flavored, is so inferior in some situations, as to be scarcely worth gathering. Some other pears, however, lose their distinguishing traits entirely, and bear nothing suitable for human lips. Of this class has been the St. Ghislain in my grounds, where the tree stood neglected for several years, and caused me to wonder how any thing so insipid could have passed through the hands of Robert Manning. Yet that eminent and worthy pomologist was not to blame. An accidental improvement of its condition, caused it the last season to bear excellent fruit, increased some in size, but immensely in flavor.

"It would seem that *flavor* is the last touch of perfection that some pears receive; and that if the nourishment of the tree be exhausted with their growth, so that nothing is left for the last finish, they are tasteless and worthless. This is not the case however with all sorts of fruit; and exceptions may be found in the Madeleine, Seckel, and Virgalieu; but I think we have no right to condemn any variety of the pear, until the tree has done its best—that is, borne fruit in a thriving condition."*

"No estimate," says Samuel Walker, "can be made of the true character of any fruit, more particularly of the pear, unless the specimens are fair, well grown, of full size, and quite ripe: or, in other words, in the highest state of perfection the variety will attain under the most skilful management and favorable season. Some varieties, under the care of a lover of fruits, well cultivated in a congenial soil, may be compared to 'refined gold,' while the same variety in unskilful hands, the trees neglected, in grass land, or in wet and impoverished soil, may prove as 'dross.'"

with great success, and is there regarded as the most valuable of all known pears. An interesting example occurred the past season in the garden of Dr. Wendell of Albany, where trees of this variety, in soils of different qualities exhibited all the grades of difference from blighted and worthless fruit, to rich golden specimens. Further evidence on this subject is furnished by the fact that the Beurré Diel and other sorts of quite recent origin, have in unfavorable localities already exhibited the cracked and blighted appearance falsely ascribed to old age.

* David Thomas, in Ohio Cultivator, 1845, p. 6.

INFLUENCE OF THE SOIL AND STOCK.

There was much truth in the remark of Bacon, that "the scion overruleth the stock quite, the stock being passive only." The change which takes place when the sap is converted into the descending juices, and thence into fruit, is effected entirely by the leaves; that is, when a pear is grafted on a quince, the entire elaboration of the juices is effected by the leaves of the pear, and the perfect fruit of the pear is the result, and not a cross or mixture of the two fruits. Hence the error of the notion formerly held, that the stock might produce a distinct specific change, analogous to that in hybrids.

But although one species, or even variety, cannot be changed to another by the stock which supports it, a slight modifying influence may be exerted by the shade of difference between the sap of one species and that of another. The sap of the quince may exert a sensible effect, small in degree, even after it has undergone the great change which is effected by the leaves of the pear. We accordingly find some sorts of pear improved, and others deteriorated on the quince.

There is doubtless an analogy in the influence exerted by different stocks, and by different soils. As the earth is colder in summer a few feet below than near the surface, it is highly probable that such soils as variously favor the downward extension of roots, may modify the character of fruits like the changes of seasons. Different trees of the same variety are known to be affected by slight shades of difference, which are often ascribed entirely to the stock, though the soil doubtless has a large share of influence. This view is further indicated by the increased or diminished luxuriance of some kinds when growing in a light or a heavy soil. Different degrees of fertility often produce material effects, both in productiveness and flavor.

There is no doubt that *stocks* on which trees are grafted, operate in some degree in a similar way. Some, like a rich soil, assist the more rapid growth of the branches; others, like a sterile one, retard it; hence corresponding results on the fruit may be expected.

Stocks may hasten or retard ripening; they may affect the size, color, and quality of fruit. The temperature,

depth, and other characters of soils may do the same. Tender kinds are made hardier on hardy stocks, not because of any specific influence, but the usual supplies of sap are imparted sooner in spring and withheld earlier in autumn, and the tender wood has more time to mature—precisely similar to the planting of tender trees on sterile or rocky soils, which cause an earlier cessation of growth.

Although, as a general rule, the change in quality is so small as to be rarely taken into account in practice, it is in some rare instances considerable, and is worthy of investigation and experiment. Early fruits have been sometimes retarded a few days in ripening when grafted upon late varieties of their own species, and their maturity has been hastened on early stocks. In one case, the Red Magnum Bonum plum ripened ten days earlier when grafted on the Cherry plum, a variety which matures at midsummer, than when worked upon a late prune. In another instance, late peach stocks were found to retard a few days the sorts budded upon them.*

In one instance, related by President Knight, a very marked change was effected. His garden contained two trees of the Acton Scott peach, one growing upon a stock of its own species, and the other on a plum, other circumstances being the same. The fruit of that upon the plum was larger and much more red to the sun; but its pulp was coarse, and its flavor so inferior that he would have denied the identity of the variety had he not himself inserted the buds. Such remarkable instances are to be regarded as of very rare occurrence.

Salt peaches or plums, show that foreign substances may enter the juices, and modify or change the quality of the fruit, as well as poison or induce disease in the tree. Soluble substances in the soil may thus exert a sensible influence. In the same way, the peculiar character of the sap and secretions of a stock may produce a like result.

The increased productiveness effected by dissimilar stocks, is often so great as to become a very important object in practice. "In proportion," says Lindley, "as the scion and the stock approach each other closely in constitution, the less effect is produced by the latter; and on the contra-

* Hort., III., p. 191.

ry, in proportion to the constitutional difference between the stock and the scion, is the effect of the former important. Thus, when pears are grafted or budded on the wild species, apples upon crabs, plums upon plums, and peaches upon peaches or almonds, the scion is, in regard to fertility, exactly in the same state as if it had not been grafted at all; while on the other hand, a great increase of fertility is the result of grafting pears upon quinces, peaches upon plums, apples upon white thorn, and the like. In these latter cases, the food absorbed from the earth by the root of the stock, is communicated slowly and unwillingly to the scion; under no circumstances is the communication between the one and the other as free and perfect as if their natures had been more nearly the same; the sap is impeded in its ascent, and the proper juices are impeded in their descent, whence arises that accumulation of secretion which is sure to be attended with increased fertility." This view is strongly corroborated by the striking similarity between the swollen portion of a grafted limb on a dissimilar stock, as a plum on the peach, immediately above the place of union, and the swollen portion of an ungrafted tree bound with a ligature.

From the preceding remarks, we may arrive at the following conclusions:—

1. That the difference in the soluble matter contained in the sap of dissimilar stocks, may exert a modifying influence in the fruit; and that soluble matters in the soil, or their absence, may in a slight degree do the same.

2. That a further change is at the same time effected by increasing or lessening the supply of sap from the stock to the graft; and that a similar change may result from a fertile or sterile soil.

3. That both early productiveness and early maturity may be produced by a stock or a soil which lessens the luxuriance of the tree; dwarf trees and those of old or diminished growth maturing their crops perceptibly earlier than those possessing great thriftiness and vigor.

As a general rule, the influence of the stock is not to be taken into account in ordinary practice, except with kinds of very different natures. Cultivation and fertility of soil are of incalculably greater importance. And while the effects of climate are to be attentively observed in making a selec-

tion of varieties, the improvement of those selected sorts, to the highest degree of perfection, is only to be attained by skilful culture.*

INFLUENCE OF PRODUCTIVENESS.

When fruit is thick upon the branches, both size and flavor are diminished. Many kinds are rendered nearly worthless by overbearing. It is often observed that early apples and peaches, remaining last on the tree, are much more delicious than the earlier portions which ripened on crowded limbs. With some varieties, the effect of productiveness is so great as wholly to alter the character. A tree of the Heath Cling, before unknown to the person who raised it, bore the first year a very abundant crop; and the fruit, which had been recommended as of great size and excellence, was small, green, with only a disagreeable, bitter taste. In the warmer and longer summer of the following year, the fruit, which had been thinned by the frost, was three inches in diameter, very handsome, and of sweet and excellent flavor. The importance of understanding these influences, before deciding on the quality of a new fruit, is at once evident. The advantages of pruning are to be ascribed in part to the same cause.

* The influence exerted by the *graft* on the *stock*, although not strictly within the limits of this chapter, offers an interesting subject for inquiry. The extension of the wood of the stock, by successive depositions from the leaves of the graft, and through the cellular system of the bark, so as to preserve the strict specific identity of the wood of the former, is familiar to every practical cultivator. But the graft often exerts a modifying influence. The same seedling cherry stocks, grafted with sorts of different degrees of vigor, soon vary in the amount and size of the fibrous roots. Trees of the Imperial Gage and Jefferson plum, a few feet high, when budded on the wild plum, were found to have only half the amount of roots possessed by the unbudded stock, of the same age. "A graft of the Green Newtown Pippin," says Dr. Kirtland, "will invariably render the bark of the stock rough and black, (the habit of the variety,) within three years after its insertion."

CHAPTER VI.

SOIL, MANURES, SITUATION, AND ENCLOSURES.

THE SOIL for fruit trees, as well as for farm crops, should be of good quality. Whatever will produce a vigorous growth of corn and potatoes, will in general be the best for fruit trees. Sterile soil is unfavorable for both; but doubly so for the latter, for while it only lessens in *quantity* the growth of farm crops, it lessens the quantity and greatly injures the *quality* of fruit.

Good soils vary in many particulars; but as a general rule, one which is dry, firm, mellow, and fertile, is well suited to the cultivation of fruit trees. It should be deep, to allow the extension of the roots; dry, or else well drained, to prevent injury from stagnant water below the surface; firm, and not peaty or spongy, to preclude disaster from frost.

Very few soils exist in this country, which would not be much benefitted, for all decidedly hardy kinds, as the apple and pear, by good manuring. Shallow soils should be loosened deeply by heavy furrows and manure; or if the whole surface cannot be thus treated, a strip of ground eight feet wide, where the row of trees is to stand, should be rendered in this way deep and fertile for their growth. The manure should be very thoroughly intermixed with the soil by repeated harrowings. An admirable method of deepening soils for the free admission of the fine fibrous roots, is first, to loosen it as deeply as practicable with the subsoil plow; and then to trench-plow this deeply loosened bed for the intermixture of manure. The previous subsoiling admits the trench-plow to a greater depth than could be attained without its aid. The only trees which will not bear a high fertility, are those brought originally from warmer countries, and liable to suffer from the frost of winter; as

the peach, nectarine, and apricot; for they are stimulated to grow too late in the season, and frost strikes them when the wood is immature. It however happens, in the ordinary practice of the country, that where one peach or apricot tree is injured by too rich a cultivation, more than a hundred suffer by diminished growth from neglect.

Clayey and light soils in some cases require opposite management. The former, for instance, is much benefited by the admixture of chip-dirt, which renders it looser, lighter, and more retentive of moisture. But on light soils the effect is not so beneficial, and is sometimes positively injurious.*

Peaty and spongy soils are particularly injurious to tender fruits. Such soils become very warm by day, and radiate the heat rapidly in clear frosty nights; hence peaches and apricots generally perish when growing in them, the heat of the sun promoting a rapid succulent growth, which is the more easily destroyed by the succeeding intensity of cold.

SPECIAL MANURES.

Besides the more common and universal ingredients of soils, sand and clay, there are others essential to the growth of trees. Among the more important of these are potash, lime, and phosphate of lime.

Now, whatever earthy ingredients are found in the wood, bark, and fruit of trees, must be derived from the soil; and if the soil in which they are planted does not contain all these ingredients, the trees cannot flourish. It therefore becomes vitally important to supply such deficiencies by the application of the particular or specific manure needed.

But it is not to be expected that cultivators generally will be able to analyze their variously differing soils, nor to procure it done by a skilful chemist.† The next thing, then,

* A great deal of misunderstanding has arisen from an indefinite use of terms. We often notice in a region of country where a heavy, baking clay prevails, certain spots of ground locally designated as "*quite sandy*;" and in a sandy region, portions which are pointed out as "*heavy clay*." Yet we not unfrequently find that the *sandy* soil of the clay region actually contains more clay than the *clay* soil of the sandy district. The terms, as commonly used, are relative; and to decide correctly on statements made by others, we are compelled to inquire where the authors of such statements reside, and with what soils they have been familiar. The best simple rule for distinguishing, applicable to all localities, is to regard such soils as in any case are found to crack in drouth, as *heavy*, and those which never crack, as light soils.

† Considerable difficulty exists in procuring perfect analyses of soils. In examining one of the most fertile soils of Monroe Co., N.Y., Dr. Emmons did not discover even

that can be accomplished is to ascertain the component parts of the different kinds of trees, which are nearly the same in all localities. If it is found that a particular species contains an unusual quantity of some certain ingredient, we may safely conclude that such ingredient should be largely supplied as a manure.

As instances, analysis has shown that the pear, the apple, and the grape, contain, of 100 parts each of *earthy* ingredients, the following proportions of potash, lime, and phosphate of lime :—*

	Sap-wood.	Bark.
Pear.		
Potash	22	6
Lime	13	30
Phosphate of lime	27	6
Apple.		
Potash	16	5
Lime	19	51
Phosphate of lime	17	3
Grape.		
Potash	21	2
Lime	17	39
Phosphate of lime	15	5

The proportions of these ingredients, although not exceeding the quantities found in some other plants, are so large as to show conclusively the importance of a proper supply in the soil. They already exist in all soils adapted to the growth of fruit trees; but their small amount in particular localities, from natural deficiency, or from long cultivation, may render their application a matter of the greatest importance. Such application may be partially made by common yard manure, which contains them in considerable proportions; but wood ashes, in which they mostly exist in large quantities, will furnish them more freely and with a more speedy effect; as from the large proportion of animal matter in yard manure, too much succulence of growth or even

a trace of phosphates when 100 grains, and afterwards 400 grains, of the soil were operated upon, and it was only when 1000 grains were used, that a five-thousandth part was detected. Yet this minute proportion is equal to about ten cubic feet per acre with a depth of one foot, and supplies the necessary ingredient for heavy crops.

* According to the experiments of Dr. Emmons.

surfeit would result from its abundant and exclusive application, an evil in no wise resulting from the use of ashes. But over-doses, even of these, should be avoided.

The large proportion of lime in the wood and bark of the apple, indicates its value as a manure for this fruit; we accordingly find that leached ashes, which contain much lime, are eminently useful. Leached as well as unleached ashes may indeed be applied with great advantage to nearly all fruit trees. Bones contain much phosphate of lime, and, pulverized, they would undoubtedly in many cases produce an excellent effect on the pear, and other species.

Iron is found only in minute quantities in the wood and bark of trees; yet the speedy restoration from pale and sickly to deep green and luxuriant foliage, by its application to the roots in some instances, proves that however small its proportion may be, its presence is essential.

An interesting experiment is stated in the Horticulturist,* upon a large pear tree, bearing blighted, cracked and worthless fruit, which resulted in its perfect restoration to health, and the production of smooth and fair crops. This change was affected by digging, three feet distant from the tree, a circular trench four feet wide and twenty inches deep; filling this with fresh, rich soil and turf, and intermingling two bushels of scoriæ from a blacksmith's forge, two bushels of charcoal, and two pounds of potash. The fresh soil and potash, doubtless contributed largely to success. Other experiments of a similar character have been equally successful.

Dr. Kirtland states that orchards on the *limestone* hills of Ohio, invariably afford the best apples—a remark fully corroborated by other observations. The same eminent cultivator gives the following account of his success with specific manures: his pear trees on worn out land, made but *two* to *six* inches growth in a single season, and the fruit was blighted, knotted, and deficient in flavor. They soon began to exhibit evidences of disease and old age. An analysis of the soil was made by Dr. Emmons, indicating its deficiencies. Dressings of phosphate of lime, [in pulverised bones,] ashes, and barn-yard manure, with a limited supply of common salt, effected a complete renovation.

* Vol. I., p. 226.

The subject of special manures is destined to become one of great interest to cultivators. It is yet in its infancy. Many years of careful experiment, guided by patient and laborious analysis, can only carry it forward to maturity. But in the meantime, enough is known to enable orchardists to operate in many instances with great advantage. Not always knowing the deficient ingredient, they may not at once apply the precise remedy. But there are some manures that can never do injury, that will usually be highly beneficial, and sometimes yield extraordinary results. To enable cultivators to experiment with these, the following excellent practical hints are given from the Horticulturist, from the pen of A. J. Downing, its editor:—

"For old apple orchards, upon soil deficient in lime, we would recommend a top-dressing of lime—for the first time—of 200 bushels to the acre. This will, usually, if the land is in good condition, bring the trees into good bearing condition again. In some soils, the effects will be immediate, and in others it will require one or two seasons for the lime to produce its effect.*

"For middle sized bearing trees, a *peck* of air-slaked lime to each tree, is sufficient. It is, perhaps, best applied in the autumn, but it will answer very well in the spring. Scatter it evenly over the surface of the ground, as far as the roots extend. It may be ploughed or hoed under slightly, or left upon the surface, as it will find its way downwards in the soil.

"To keep an apple orchard in the *fruit-bearing condition*, in a soil not calcareous, and not naturally congenial to the tree, it should be dressed with lime, and with ashes, every alternate autumn, and manured every other spring. The same quantity of spent ashes as of lime, may be used for each tree.

"For the pear tree, we prefer the following compost. Take a wagon load of peat, or black swamp earth—dissolve 20 lbs. of potash in water, and water the peat thoroughly with the liquid. Let it lie a couple of days, and it is fit for use. Or, for the same quantity of peat, use one-third of a load of leached wood ashes, (or ten bushels of fresh ashes,)

* Oyster-shell lime is the very best—some others contain too much magnesia—but, perhaps, only a few.

mixing the whole, and letting it lie a fortnight before using it. Give each middle sized bearing tree, a *bushel* of this compost annually; a newly planted young tree, half a peck, and others in this proportion. If this compost is applied in the spring, the trees may also have a top-dressing of *bone dust*, if easily obtained, in the autumn, at the rate of half a peck to a tree.

"The same compost, and the same quantities, will answer admirably for the grape vine. But as the grape is a strong feeder, and likes more lime than the pear, we would give it besides, an autumnal coat of lime, at the rate of from 50 to 100 bushels to the acre, applied along with any manure or compost most easily obtained.

"For the plum tree, in light soils, (there is little or no difficulty in growing it in clay soils,) we would recommend a compost, made as follows: To two wagon loads of strong loam, or yellow clay, add a bushel of cheap salt and four bushels of lime. Mix the whole thoroughly; suffering it to lie at least a fortnight. Apply this as a *top layer* or *top dressing* to the soil directly under plum trees, (spreading it over the surface as far as the branches extend,) at the rate of *two bushels* to a middle sized bearing tree, or half a peck to a young, newly planted tree.

"As a general compost for fruit trees, we repeat, that nothing is equal to that formed of *ashes and peat*. These materials are easily obtained in all parts of the country, and they contain [redacted] essential in the organic and inorganic [redacted] of fruit trees. Where peat is not at hand, use wood ashes alone, at the rate of half a bushel of leached ashes to each middle sized bearing fruit tree. But as ashes furnish only the mineral or inorganic elements of food, the usual supply of ordinary manure must not be withheld, unless the soil is already sufficiently rich."

SITUATION.

After a suitable soil is obtained, hardy trees, such as the apple, will usually succeed in almost any situation. But with tender fruits, as the peach and apricot, the case is very different. In many localities in the northern states, they are soon destroyed by the severity of winters, and their cultivation is accordingly not attempled. In others, crops are not

yielded oftener than once in two years. But some situations are so favorable, that a failure scarcely ever occurs. In planting out tender fruits, it is consequently very desirable to know what places will prove the best. Even the apple, in regions where the winters are rigorous, is sometimes destroyed by frost, and in some very unfavorable places rarely escapes.

It is familiar to many cultivators, that warm, low valleys are more subject to night-frosts, than more elevated localities. Objects at the surface of the earth become chilled by the radiation of heat to the cold and clear sky above, and they cool by contact the surrounding air,—which thus becoming heavier, rolls down the sides of declivities and settles like the waters of a lake, in the lowest troughs. This coldness is further increased by the stillness of those sheltered places favoring the more rapid cooling, by radiation of the exposed surfaces; while on hills the equilibrium is partially restored by currents of wind. Superadded to these causes, vegetation in low, rich, and sheltered places, is more luxuriant, and wood less ripened, and hence particularly liable to injury from frost. The mucky soil of vallies radiates heat rapidly from its surface. The warmth of low places, during the mild weather, often occurring in winter, often swells fruit-buds, and succeeding cold destroys them. On more elevated lands, vegetation escapes all these disastrous influences.

The existence of [redacted], clear nights, is often plainly observed in riding over a rolling or broken face of country. The thermometer has often shown a difference of several degrees between a creek bottom and a neighboring hill not fifty feet high. A striking proof was exhibited a few years since, after a severe night-frost early in summer. The young and succulent leaves of the hickory were but partially expanded; and where the trees stood in a valley, twenty feet deep, all the leaves had been frosted, and were black and dead, up to the level of the banks on each side, while all above the surface of this lake of cold air, were fresh and green.

In the winter of 1845-6, when the cold on a clear night sunk the thermometer several degrees below zero, after the

peach buds had been swelled by a few warm days, trees which stood on a hill thirty feet higher than the neighboring creek valley, lost nine-tenths of their blossoms, while on another hill sixty feet high, nine-tenths escaped. The lake of cold air which covered the top of the smaller hill did not reach the summit of the larger.

The cultivation of the peach is rarely attempted in the southern tier of counties in the state of New-York. Proofs are not wanting, however, that it might be entirely successful on selected ground. In the valley of the Conhocton, which is flanked by hills 500 feet high, peach trees have been completely killed to the ground. But on one of the neighboring hills, 500 feet above, and probably 1,200 feet above the level of the sea, an orchard planted in good soil, yields regular crops. In the town of Spencer, Tioga county, near the head of Cayuga inlet, peaches have withstood the climate and done well, at an elevation of 700 feet above Cayuga lake. In the northeastern part of Pennsylvania, probably 1200 or 1500 feet above the level of the ocean, in the summer of 1835, after one of the severest winters for twenty years, the only two peach trees observed in travelling many miles, were full of peaches; while after the same winter, a large tree in Stroudsburg valley, was noticed killed quite down to the ground. While those hills are usually covered with snow throughout the winter, and vegetation consequently remains uniformly dormant, the valleys are subjected to occasional thaws, and are more un favorable to tender vegetation.

These cases show the importance of elevated sites. A dry, firm soil, is however, of great consequence. The influence of a compact knoll, rising but slightly above the rest of the field, has been observed to save from frost the corn which grew upon it; while on the more mucky or spongy portions of the rest of the field, radiating heat more freely, the crop has been destroyed. Cultivators of drained swamps have found it necessary to plant such lands with tender crops two or three weeks later than the usual period on upland. The successful cultivation of the peach and the grape, on the gently swelling hills called *mounds*, in the in the western prairies, while the crops are destroyed on the adjacent dark and porous soils of the plains, affords ano-

ther example. In Lycoming county, Pa., on the banks of the Loyalsock, a creek so rapid that no muck is deposited, but fine dry soil, peaches have been raised, though the cold is often intense.*

Sometimes the effect of unfavorable soil more than overbalances that of situation. In some of the hilly parts of western New-York, where the highest land is peaty, spongy, or springy, and the valleys dry and firm, the latter are found best for the peach. "Some years ago, we drained a shallow swamp; and though the situation is high and airy, peach trees of the best bearing kinds planted there, have always been unproductive."†

The preceding facts furnish strong reasons for believing, that in large portions of the northern states, where the cultivation of the peach has been entirely relinquished in consequence of the only attempts made having been in the warm vallies, abundant crops might be regularly obtained by a proper selection of soil and locality. Even much further south, the occasional destruction of tender fruits, points out the great importance of careful attention to situation. The death by frost of large orange trees in Florida in 1835, proves that all parts of the country are liable to such disasters, and that no means of prevention are to be overlooked.

Occasionally crops are saved by the artificial application of a remedy, which may be briefly glanced at in connection with this subject. In one case, a bank of snow covering the lower limb of a peach tree, saved the fruit, while all on the rest of the tree perished. In another, a row of peach trees close along the north side of a fence, where snow-drifts lay, were more fruitful than the other trees. Hence the practice of piling snow round them has been recommended, and in some cases practiced with success. It cannot be considered infallible in any situation. It is only useful where a slight reduction of temperature is sufficient to prevent the *starting of the buds*. We can easily conceive such a time, when a part of the buds start, and a part do not. In one season, the lower buds on the tree, which re-

* The skilful cultivator, as he values the size and quality of his fruit, will readily distinguish between a rich soil consisting chiefly of spongy muck and peat, and a dry and firm soil rendered fertile by a due admixture of these substances, and potash, lime, and good manure.

† D. Thomas, Trans. N. Y State Ag. Society, vol. I.

ceived the reflected heat from the ground, nearly all started, and were killed, while those on the tops of the trees were not injured. It is evident that a very slight depression of temperature would have been sufficient to have prevented the lower buds from starting. But the warmth may be so great, either late in autumn or in mid-winter, that no check of the kind would be sufficient.

It has often been observed that woods or thick trees, buildings, high board fences, or steep hills, on the east side of peach orchards, protect the crop. Hence the erroneous opinion, that it is the *east wind* which does the damage. It is the sunshine upon the frozen buds which destroys them; hence, a clouded sky after a clear frosty night, by preventing sudden thawing, sometimes saves a crop. Covering trees of rare kinds with mats, to shade them from the morning sun, after an intensely frosty night, might sometimes be highly beneficial.

Influence of deep Lakes and Rivers.—Large bodies of unfreezing water in the bottoms of valleys, will reverse some of the preceding rules, and the banks of such waters are peculiarly adapted to the cultivation of tender fruits. They soften the severity of the cold, by the large and warmer surface constantly presented; on the other hand, they chill the dangerous warm air which starts the buds in winter; and they afford great protection by the screen of fog which they spread before the morning sun. Along the borders of the lower parts of the Hudson, and on the banks of the Cayuga and Seneca lakes, tender fruit trees often afford abundant crops, while the same kinds are destroyed only two or three miles distant. Along the southern shore of Lake Ontario, the peach crop scarcely ever fails, and the softening influence of that large body of unfreezing water, extends many miles into the interior.

ENCLOSURES.

The skilful cultivator, after having prepared his ground, procured the best trees the country affords, carefully transplanted them, and watched over them, and given them careful and laborious attention for years, feels a very natural desire to partake of their fruits. But this he cannot do, in many places, unless his fruit garden is protected

from idle boys' rambles. It cannot be concealed that our country is rather remarkable for its fruit pilferers. It is feared it will continue to be so, until public opinion shall place the young man who steals a pocket-book, and the depredator of fine fruit, which has cost the owner as much care and labor, and which money cannot replace, on precisely the same level.*

This formidable evil has deterred many from planting fruit-gardens. The most quiet and secure protection is afforded by a good thorn hedge. The English hawthorn, far to the north, will generally succeed quite well for this purpose; the Washington and Newcastle thorns are less liable to disaster from drouth and hot summers, and the attacks of insects; but the Buckthorn, which gradually thickens in armour as it becomes older, appears to be the only perfectly hardy and reliable hedge plant for severe climates. The Osage Orange, however, where the winters are not too cold, will be found best of all. Its numerous and terrific thorns render it perfectly impassable. It is sufficiently hardy in all places where the peach crop generally escapes. Further north than 41 or 42 degrees of latitude, it cannot be expected to succeed in low valleys; but on elevated ground, the winter-killing of its smaller shoots, will only tend to thicken it below, like trimming with shears. The Michigan rose, in connexion with a high board or picket fence, which it has covered and interlaced, has been found an effectual protection to a fruit garden. It grows as freely from layers and cuttings as the grape vine.

* "The native fruit of a thickly populated country, growing without culture and free for all, has doubtless had its share in producing this laxity of morals. 'I would sooner have a hundred Irishmen round me than one Yankee,' was the declaration of a sufferer, whose fruit had been plundered near the line of the Erie canal, when that great work was in progress. But Europeans are generally more exemplary on this point than Americans—shame on us! When Professor Stowe was in Prussia, where the roads are lined with fruit trees by order of the government, he observed a wisp of straw attached to particular trees, to protect the fruit; a sufficient guard; but he suggested to the coachman, that in America, it might only prove an invitation to plunder. 'Have you no schools?' was the significant reply.

"Yes, we have schools; but how many where the child is taught to respect his neighbor's property? Too often he acquires literature and vice at the same time. The state of New-York is famous for her schools and her prisons; the latter to supply the defects of the former system, which they do however, very imperfectly. Better let the mandate go forth that the *morality of the Bible* shall be *one* of the chief objects of instruction. TEACH HER CHILDREN TO BE HONEST, and then with science and literature, a foundation for true greatness and prosperity would be laid."—*David Thomas, in Trans. N. Y. State Ag. Society, Vol. 1, p. 223.*

CHAPTER VII.

TRANSPLANTING.

NEARLY every fruit tree must at some period be removed from the nursery, and transplanted into the orchard or garden. When it is remembered that in a large number of instances, where hastily performed, the trees perish from the act; and that in a still larger number, including a great majority, a severe check is given to their growth, it needs no argument to show the importance of transplanting well.

This removal is from necessity, an act of violence. As frequently performed, it is so severe that it either results in death, or a lingering recovery. But with the skilful operator, the rigor of the operation may be so softened, as to be not only attended with perfect safety to the tree, but with scarcely an abatement in the thriftiness of its growth.

It may indeed sometimes happen, that careless management from an accidental combination of favorable causes, is followed with success. The entire failure of similar treatment in other cases, proves the superiority of the mode which shall invariably accomplish the object, with the same certainty that cause is followed by effect. The most skilful cultivators, who have the whole operation at their control, never expect to, and actually do not, lose one tree in a thousand.

Taking up the tree, and shortening-in. Every person, about to transplant a tree, should remember that the roots and the leaves both perform very important offices, the one constantly dependent on the other. The first collects food for the tree; the other elaborates and prepares this food for use. Without the roots, the leaves and rest of the tree perish. Without the leaves, the root cannot grow, and eventually dies.

It is obvious that if a tree could be removed with all its roots, including all the numerous thread-like radicles, and

placed in its new situation precisely as it stood before, it would suffer no check in growth. The nearer then, we can approach this, the greater will be our success.

There is no difficulty in saving the leaf-bearing branches. All our attention must accordingly be directed to the roots. The spade should be set into the earth at a distance from the tree, and the whole carefully lifted, not forcibly withdrawn, from the soil. Or, so much of the earth should be separated in a circle by the spade, that when the tree is withdrawn, a large portion of the soil may be lifted with it with the small fibres.* The roots of a young tree usually extend in a circle quite equal to its height; the workman, therefore, who cuts off all within six inches of a tree which is itself eight feet high, deprives it of a large portion of its means of sustenance. In the annexed figure, *a* indicates the trunk of the tree; *bb* the circle of roots cut off with the spade in a hasty removal; and without this circle, the rest of the roots which are left in the earth. Fig. 35.

Fig. 35.

But in ordinary, or even very careful practice, a part of this wide network of fibres must necessarily be separated from the tree. It is evident then, that the usual supplies of sap to the leaves must be in part cut off. Now the leaves are constantly (during day) throwing off insensible moisture into the air; and good sized trees thus give off daily, many pounds. Reduce the supply from below, and the leaves cannot flourish; and if the reduction is severe, the tree withers and dies.

The remedy consists in lessening the number of leaves,

* Some cultivators have adopted the opinion that the small fibres are unimportant, and may be cut off without lessening the chances of growing. But this can only be true with very small trees or seedlings, which quickly reproduce a multitude of small roots, after the top is removed for the insertion of a graft; or where the fibres of larger trees have been killed by exposure after removal, and which are followed by a necessary lopping of the branches.

so as to correspond with the diminished supply. This may be done in two ways: one, by shortening back every shoot of the previous year, to one quarter of its length, and in extreme cases, every shoot may be shortened back to *one bud*, just above the previous year's wood. The other mode, attended with more labor, but preserving the full size of the head, is to leave all the shoots entire, and remove every alternate bud, leaving the terminals, or remove two-thirds or three-quarters of the buds in the same way. Neither of these modes can in the least degree destroy the natural symmetry of the tree. Cutting off large branches at random often quite spoils the shape. Fig. 36, represents an unpruned tree, and fig. 37, the same with the shoots shortened back.

Fig. 36

Fig. 37.

Where peach and other trees have been once a year trimmed up to a single stem, while in the nursery, the mode of shortening is shown by figs. 38 and 39.

Fig. 38.

Fig. 39.

A few experiments only are needed to convince any one of the advantages of thus cutting in the shoots. In 1846, an orchardist on the Hudson, carefully transplanted 180 apple trees into good mellow soil. The roots had been cut rather short in digging. One-half had their tops shortened back, so as to leave only one bud of the previous season's wood; the heads of the other half were suffered to remain untouched. The season proved favorable. Of the ninety which had their heads pruned, only *two* died, and nearly all made fine shoots, many being eighteen inches long. Of the ninety unpruned, *eight* died; most of them made but little growth, and none more than six inches. Both the first and

second year, the deep green and luxuriant foliage of the pruned trees afforded a strong contrast with the paler and more feeble appearance of the other.* A similar experiment was made with 78 peach trees, of large size, three years' growth from the bud. One-half were headed back so as to reduce the buds one-half; the rest were unpruned. The season was rather dry, and *twelve* of the 39 unpruned trees perished; and only *one* of those which were headed back. The unpruned, which survived, lost parts or the whole of the upper portions of their branches; the pruned, made fine bushy heads of new shoots.* It has been found useful to shorten in the shoots of peach trees so severely as to reduce the heads to only one quarter of the original number of buds. This was tried with great success the past season. Trees, only one year's growth from the bud, transplanted in the usual manner unpruned, were placed side by side with others of four years' growth, and with trunks an inch and a half in diameter, the heads being pruned to one quarter their size. The growth of the former was feeble; the large trees, with pruned heads grew vigorously. Again, trees set out before the buds had opened, and without pruning, presented a more feeble growth than others removed when the leaves were an inch long, with a copious shortening-in of the branches.

The degree to which this shortening should be carried, must depend much on climate. In the cool moist atmosphere of England, the leaves perspire less, and a larger number may remain without exhausting the supply from the roots. In this country, the perspiration is more rapid, and fewer leaves can be fed, until new roots furnish increased supplies.

But in no case should the lopping be excessive; for as the reproduction of roots depends upon the action of the leaves, a disproportionately small number of the latter, would fail to produce a speedy renewal of the former.

And especially, no one should unnecessarily mutilate the roots, with the hope that lopping the head will remedy the evil; for it rarely happens, that with the most careful digging, more than one half the entire amount of roots will be secured, which would in that case, require the removal

* Hort., Vol. II., p. 219.

of at least half the head. A badly mutilated root may be saved alive, by a severe lopping of the shoots; but it cannot possibly succeed so well as a tree with a fine large mass of uninjured fibres.

Trees which quickly reproduce new shoots, as the peach, may be more closely shortened back than others having a less reproductive power, as the apple. The cherry throws out a new growth still more reluctantly, and hence more care is needed in digging up the roots entire.

A very mistaken notion prevails with many who purchase trees for orchards, that the most important requisite is to obtain large straight stems and handsome heads, while the condition of the roots is regarded as entirely subordinate. It is far preferable that the limbs be mutilated than the roots; for though the tree may have a bad appearance when first transplanted, well preserved roots will soon restore the loss.

Preparing the ground and manuring. Ground intended for trees must be secure from danger of being flooded in wet seasons, and from all liability of becoming water-soaked beneath the surface. If not naturally dry enough, it must be thoroughly underdrained.

The next requisite, and it is one of the greatest importance, is to deepen and enrich the soil by *trenching.* In the garden this is done with the spade; but in the open orchard, it is cheaply and thoroughly effected, by first loosening the earth to a depth of at least twenty inches with a subsoil plow. Next, to intermix the whole loosened bed of soil thoroughly together, it is *trench-plowed.* It would be impossible to attain this depth with a common plow, without previous subsoiling; and subsoiling fails to accomplish a proper admixture without trenching. Manure is to be applied in sufficient quantity to render the whole fertile; the amount to be graduated by the character of the ground. Trenching or deepening must in no case be omitted; for if the soil is exhausted, if it is poor, if liable to suffer from drouth, it is a remedy which applies in all cases. If this deepening and enriching cultivation can be continued for a year or two, in connexion with root crops, before planting, the ground will be brought to the finest condition.

In setting out large orchards, if the whole field cannot be deepened, a strip of land ten feet wide extending across the orchard, may be treated in the same way, in the centre of which each row is to be set; and the intermediate spaces, constituting two-thirds or more of the whole, may be prepared afterwards, by the time the roots have passed the boundaries of the first.

Now, when it is recollected that a good orchard is worth annually a hundred dollars per acre, and that this thorough preparation will bring trees into plentiful bearing, in connexion with good subsequent culture, in one third of the time required where trees are crowded into small holes in hard ground, it must be perfectly plain to every one that the former is by far the cheaper treatment.

Where, from any unavoidable cause, trench-plowing cannot be accomplished, the holes should be seven or eight feet in diameter, and from one and a half to two feet deep. The earth should be mixed with a liberal allowance of well-rotted manure, or still better with a compost made and worked over some weeks previously, consisting of two or three parts of muck or peat, one of barn manure, and a fifth part of leached ashes. This is indeed an excellent manure for fruit trees in all cases with ordinary soils. If the subsoil is sterile, it should be scattered back out of the way.

In rare cases, where rotted manure or compost is not at hand, and it becomes necessary to use fresh manure, it must be thoroughly incorporated with an iron rake into the soil, and this mixture not placed in contact with the roots but at such a distance that they may not reach it till after some months of growth, when it will have become well combined with the soil. One quarter manure will be an abundant proportion in any case.

Preparing the roots. Before a tree is set in the earth, all the bruised or wounded parts, where cut with the spade, should be pared off smoothly, to prevent decay, and to enable them to heal over by granulations during the growth of the tree. Then dip them in a bed of mud, which will coat every part over evenly, and leave no portion in contact with air, which accidentally might not be reached by the earth in filling the hole. The bed of mud

is quickly made by pouring into a hole a pail of water, and mixing it with the soil.

Setting the tree. It should not be set deeper than it stood before removal. Deep planting injures the tree, and when excessive, may cause its death. Setting it upon the surface of the ground without any hole, and placing a bed of fine earth upon the roots to the usual depth, is preferable, and on shallow or unprepared soils, or such as are quite clayey and rather wet, has been quite successful. When placed in the unfilled hole, if it is found to be too deeply sunk, a mound or hillock is to be made under the centre, to raise it sufficiently, and the roots separated and extended to their full length. Fine rich mould is then to be sprinkled or sifted over, taking care to fill all the interstices, and using the fingers to spread out all the fibres during the operation. The mellow earth should rise two or three inches above the surrounding surface, to allow for its subsequent settling.

In nearly all soils, *the use of water in settling the earth* among the roots will be found eminently serviceable. Dashing in a few quarts before the hole is quite filled, is the more common way: but an admirable mode is to settle the fine earth as it is constantly sifted in, by a regular shower from a watering pot, one man holding the tree, a second filling in the earth, and the third applying the water. By this process the roots are not disturbed in their position, and every cavity about them is filled in the most perfect manner. The trees will be found to maintain their position better than when pulverised earth alone is used; for although it may at first be easily moved while surrounded by the half liquid mass; in a few hours the earth around it will absorb the superabundant moisture, and it will become as firm as when it has stood for weeks in its new position.

Fig. 40.

Stiffening against the wind.—Newly planted trees, being acted on as levers by the wind, often press aside the earth about their stems, and make an opening down to the roots, which in consequence suffer from both drouth and disturbance. There are two ways to prevent this disaster. In autumn transplanting, the best way is to embank a mound of earth about

the stems, from ten to eighteen inches high, as the size of the tree may require, fig. 40. This mound performs the triple office of stiffening the tree, excluding mice, and covering the roots from frost. Only a few seconds are required to throw up one of these conical heaps of earth. After the tree commences growing, the mounds are removed. Trees which have had their heads lightened by the shortening process, already described, will not often need any other protection.

But when the trees are large, or the situation is windy, *staking* becomes necessary. If driven before the roots are covered, they may be erect, as in fig. 41; if driven afterwards, they may be slanting; and in both cases, straw bands should be first wrapped once round, to prevent the trees from chafing.

Fig. 41.

Watering. A very common error is the belief that trees need frequent watering before they are in leaf. Deluging the roots, while in a partially dormant state, is as hurtful to trees as to greenhouse plants, and a continued repetition of it is almost certain death. When a plant is in a state of rapid vegetation, large quantities of moisture are drawn up by the leaves and thrown off, but while the buds are unexpanded, the amount consumed is very small. Fruit trees sometimes remain with fresh and green branches, but with unswollen buds, till midsummer. Instead of watering such at the roots, let the tops be wet daily at evening, with a watering pot, and it will in nearly all cases bring them into active growth. In extreme cases, shading the stem in addition to the watering, will be found beneficial.

The following successful treatment in transplanting, in cases that appeared almost hopeless, was practiced by the late S. G. Perkins, of Boston:—

"Some ten years ago, I imported from Paris two hundred and ten pear trees on quince stocks, whose roots, on their arrival, I found to be entirely black and dead. I shaved off with a drawing knife all the roots down to the stump. These I planted in trenches, tying them to cross-bars to keep them firm, and then filled up the trench with good soil. The heads and bodies of these trees were regularly washed in dry weather until they began to sprout which most of them

did in abundance during the summer, and I finally saved out of the whole number, one hundred and seventy-four, which became as well rooted and as good trees as any in my garden.

"This has happened more than once. Three or four years ago, I imported among other trees, twenty plum trees, from six to seven feet high, the heads of which had been budded the previous year in France. These buds had grown from nine to twelve inches long, and were perfectly fresh when they arrived; but the roots on examination were found entirely dead. Two of these I gave away. One was good for nothing, and the other seventeen I planted in my garden, having cut out all the roots that had fibers, they being entirely dead. One of my men said I might as well plant my walking stick. Sixteen of these are now flourishing trees, well grown and well rooted, new roots being induced by means of washing the upper part of the tree."

Watering the roots, even of fast growing trees, will rarely become needful if the soil is deep and is kept mellow But whenever it is performed, the surface earth should be thrown off, the water poured in, and the earth replaced. This will admit the water at once to the roots, and leave the surface mellow; while by watering the top of the ground, the water will perhaps fail to reach the dry soil below, but only serve to harden and bake the surface.

Mulching, or covering the ground about the tree with straw, coarse barn-yard litter, or, what is still better, leaves from the woods, will in nearly all cases obviate the necessity of watering. It is an excellent protection against mid-summer drouths, which so often prove destructive to newly transplanted trees, after they have appeared in leaf. A correspondent of the Horticulturist, mulched 50 trees out of 150, all of which had commenced growth alike. Those which were mulched, all lived. Of the hundred not mulched, fifteen perished. The weather was hot and dry at midsummer.

Trees received from a distance, and injured by drying, should immediately have their roots coated by immersion in a bed of mud; and then the whole stems and branches buried in moderately moist earth for a few days. They will gradually absorb moisture, through the pores in the bark, and re-

sume their freshness. Plunging into water, as sometimes practiced, is more liable to induce decay by water-soaking.

Season for transplanting. Much discussion has arisen on the relative advantages of autumn and spring transplanting. When the work is well done, both are successful. For apple and other hardy trees, autumn is perhaps the best, as the soil becomes well settled about the roots, and the trees commence growing without interruption in spring.* The more tender trees, as apricots and peaches, removed to a colder region, may be in more danger, especially if the roots have been much mutilated and the setting out badly done. A neighbor purchased fifty peach trees in the autumn, and lost half of them the following severe winter; another bought fifty the next spring, and lost only one. Was this a conclusive proof that spring planting was best? By no means; for in the former case they were set out in grass land, and received no culture; in the latter, they had the best care. The same autumn a neighbor saved all his peach trees by good management; while the same spring another lost most of his by neglect. We may hence infer that good management is of incomparably more importance than the season of the year.†

But there are many things to be taken into account in drawing conclusions. It has been remarked that tender trees taken to a colder climate may be in danger of winter frosts. Good, thrifty, and well ripened wood, however, where the trees have grown on high, dry, firm soil, even from a warmer region of country, are much safer than trees of succulent growth and badly ripened wood, from a colder. So again, trees equally hardy, might perish when set out on a low, sheltered place, or on a wet soil, while they would endure the severest rigors of our winters on a drier and more elevated piece of ground.

Again, success has sometimes attended careless transplanting; while on the other hand, the greatest care has

* The remark of Dr. Lindley that *early* fall transplanting is decidedly best, by permitting the formation of small roots and a consequent establishment of the tree in the soil before winter, though applicable to the moist climate and long mild autumns of England, is not so here where the growth while it lasts is more rapid, its cessation more sudden, and the dryness of the air unfavorable to removal before growth ceases.

† Embanking round the tree, as described on a preceding page, is an excellent protection from frost for tender trees set out in autumn.

resulted in loss. In the first instance, the trees may have been in the best condition, the roots uninjured, the soil just right, and every attending circumstance favorable. In the other, every thing may have been done right, but some accidental disaster proved ruinous. A neighbor, as an instance, set out several peach trees in autumn in the best manner; but his soil was low, and became soaked with water in winter, causing their death. Removal from high and exposed, to low and frosty ground, or the reverse, may often influence the result. Even a wet subsoil, where the surface has been dry, has destroyed tender trees in winter, as the apricot, without removal.

Again, when the soil is a heavy clay, and holds water like a tub, tender trees are in great danger from autumn transplanting, unless provision is made for draining the holes; which may be effected by running a deep furrow from one hole to the other, along the line of trees, and using brush, cornstalks, or straw, as a temporary underdrain for the water to soak away.

As a general rule, the proper season for the removal of trees is at any period between the cessation of growth in autumn, —usually a little later than mid-autumn in the northern states,—and its recommencement in spring. The earlier in spring the better; but if deferred till the buds are much swollen, the roots should be coated immediately with mud, and kept moist till again set out. Transplanting may be performed in winter, whenever the ground is open, and the air above freezing; but roots which are frozen while out the ground, will perish unless they are buried before thawing.

When it becomes necessary to keep trees through winter without setting, as often occurs where they are received from a distance, the roots may be placed sloping in a trench on a dry spot of ground, and fine earth thoroughly sprinkled in among them, filling up all interstices; and if theyare of tender kinds, one-half of the stems may be covered with earth. Trees are often badly kept from neglect to fill up the cavities, which may be prevented by dashing in water, as in transplanting.* If received late in autumn, after having

* Trees packed for distant conveyance, should always have the roots coated with mud; for if in spring, it will tend to prevent their drying, as warm weather approaches; and if in autumn, it will assist the more gradual and safe abstraction of the frost if

been frozen, the roots should be buried as speedily as possible before thawing takes place, the gradual abstraction of the frost by the soil being perfectly safe, in the same way that it takes place every spring when the frozen roots of standing trees are thawed with the thawing of the ground.

The size for transplanting, must vary with circumstances. Six to seven feet high is large enough under ordinary circumstances, but those much larger may be successfully removed if they have been previously prepared by shortening the long roots to induce the emission of a mass of smaller fibres near the centre or stem. This is done one year previously, by running a spade into the earth in a circle about the foot of the stem, if the tree yet stands in the nursery, or by cutting a circular trench around the tree if it is a large standard in open ground.

Trees not over four or five feet high would usually succeed best with the usual hasty mode of digging, as a proper balance between the top and the root would be more nearly preserved, the danger of dying would be lessened, and the vigor of growth being less checked, they would as soon attain a bearing state.

On a review of the essential requisites for successful transplanting, they may be summed up briefly as follows:

1. A previous preparation of a rich deep bed of mellow earth to receive the roots, and land which cannot be water-soaked.
2. Removing the tree with as little mutilation of the roots as practicable.
3. Paring off the bruised parts.
4. Shortening-in the head, in a greater or less degree, to correspond with the necessary loss of roots.
5. Immersing the roots in mud.
6. Settling the earth with water.
7. Planting no deeper than before.
8. Staking or embanking to prevent injury by the wind.
9. Watering the stems and branches only, before the appearance of the leaf.
10. Mulching, where danger of mid-summer drouth is feared.

they should happen to be frozen. In addition to this, they should be copiously packed in damp moss, which retains moisture a long time, and does not heat. For sea-voyages, however, the moss should not be damp, as the sea-air will preserve the requisite degree of humidity, which otherwise would be excessive and injurious.

CHAPTER VIII.

CULTIVATION OF THE SOIL.

The cultivator, having transplanted his trees in the best manner, and secured them from disaster by every means which skill can devise, has a still more important task yet to perform,—the cultivation of the soil.

It is more important, because it is not commenced and finished in a day, but needs constant attention for years; and in ordinary practice it receives greater neglect. For, of the thousands of trees which are every year transplanted in all parts of the country, the assertion may be made with safety, that *more are lost from neglected after-culture, than from all other causes put together.*

To purchase and set out fine fruit trees of rare sorts, in a baked and hardened soil, whose entire moisture and fertility are consumed by a crop of weeds and grass, might very aptly and without exaggeration be compared to the purchase of a fine horse, and then perpetually to exclude him from food and drink.

Here is the great and fatal error with a large portion who attempt the cultivation of fruit. We may not incorrectly divide these into three classes:

1. Those who, having procured their trees, destroy them at once by drying them in the sun or wind, or freezing them in the cold, before setting out.

2. Those who destroy them by crowding the roots into small holes cut out of a sod, where, if they live, they maintain a stunted and feeble existence, like the half-starved cattle of a neglectful farmer.

3. Others set them out well, and then consider their labors as having closed. They are subsequently suffered to become choked with grass, weeds, or crops of grain—some live and linger, others die under the hardship; or else are demolished by cattle, or broken down by the team which cultivates the ground.

A neighbor purchased fifty very fine peach trees, handsomely rooted, and of vigorous growth; they were well set out in a field containing a fine crop of heavy clover and timothy. The following summer was dry; and a luxuriant growth of meadow grass nearly obscured them from sight. What was the consequence? Their fate was precisely what every farmer would have predicted of as many hills of corn, planted and overgrown in a thick meadow,—very few survived the first year.

Another person bought sixty, of worse quality in growth; he set them out well, and kept them well hoed with potatoes. He lost but one tree; and continuing to cultivate them with low hoed crops, they now afford yearly loads of rich peaches.

Another neighbor procured fifty good trees. Passing his house the same year late in summer, he remarked, "I thought a crop of wheat one of the best for young peach trees?"—"Just the reverse; it is one of the worst—all sown crops are injurious; all low hoed ones beneficial."—"Well," answered he, "I have found it so—my fifty trees all lived it is true, but I have lost one year of their growth by my want of knowledge." On examination, they were found in excellent soil, and had been well set out. All the rows were in a field of wheat, except one which was hoed with a crop of potatoes. The result was striking. Of the trees that stood among the wheat, some had made shoots the same year, an inch long, some two inches, and a very few, five or six inches. While on the other hand, on nearly every one that grew with the potatoes, new shoots a foot and a half could be found, and on some the growth had been two feet, two and a half, and three feet. Other cases have furnished nearly as decisive contrasts.

An eminent cultivator of fine fruit, whose trees have borne for many years, remarks: "My garden would be worth twice as much as it is, if the trees had been planted in thick rows two rods apart so that I could have cultivated them with the plow. Unless fruit grows on thrifty trees, we can form no proper judgment of it. Some that we have cultivated this season, after a long neglect, seem like *new kinds*, and the favor is in proportion to the size."

The *thick rows*, here alluded to, may be composed of

trees from six to twelve feet apart in the rows. This mode admits of deep and thorough cultivation, and the team can pass freely in one direction, until close to the row, where the soil need not be turned up so deeply, or so as to

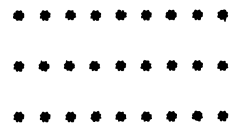


Fig. 42.

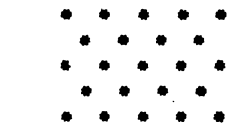


Fig. 43.

injure the roots. Fig. 42 exhibits this mode of planting; and fig. 43 another mode, where the trees are in hexagons, or in the corners of equilateral triangles, and are thus more equally distributed over the ground than by any other arrangement. They may thus be cultivated in three directions. For landscape effect, this is undoubtedly better than by any other regular order.

Trees are frequently mutilated in cultivating the ground with a team;* to obviate this difficulty, arrange the horses when they work near the line of trees, one before the other, *ad tandem*. Let a boy ride the forward one, use long traces and a *short whipple-tree*, and place the whole in the charge of a careful man who knows that one tree is worth more than fifty hills of corn or potatoes, and no danger need be feared. In the absence of this arrangement, oxen will be safer than horses.

Fig. 44.

When it becomes necessary for trees to stand in grass, as in some instances near dwellings, a circle of several feet round each tree must be kept mellow by the spade, fig. 44. The work should be shallow near the tree to prevent injury to the roots, and gradually deepen as it recedes. This operation when repeated several times during summer, has been known to increase the growth five fold. But a not less important result is the

* When bark is accidentally rubbed off, if in early summer, the fresh surface should be left untouched, and a new bark will soon form and cover the surface. Rubbing the wound with earth, spoils this surface, and leaves a bad wound.

exclusion of the mice, for which this is by far the most effectual method, if the surface is raised nine or ten inches round the tree just before winter, fig. 45. The grass no longer affords these animals any hiding place, and when they reach the bank of fresh earth, they are immediately diverted from their course, and never attack the stem.

Fig. 45.

Such a circle of dug earth facilitates the application of manure, which may be spread about the tree late in autumn, when the soluble portions are carried down among the roots by the autumn and spring rains, after which it is turned beneath the soil with the spade. Unless, however, this circle is of large size, it can afford but very partial benefit. The size should increase as the tree advances in growth. In very small trees, most of the roots are within a foot or two of the stem, but their circumference forms an annually increasing circle. Hence the frequent practice of applying manure, or digging the ground closely about the base, as exhibited in the annexed figure, (46,) is comparatively useless. Hence, too, the practice of plowing a few furrows only on each side of a row of large trees in an orchard, is greatly inferior to the cultivation of the whole surface.

Fig. 46.

Among the crops which are best suited to young trees, are potatoes, ruta bagas, beets, carrots, beans, and all low hoed crops. Indian corn, though a hoed crop, is of too tall a growth, shading young

trees too much by its formidable stalks. All sown crops are to be avoided, and grass is still worse. Meadows are ruinous. An acquaintance who purchased a hundred peach trees and placed them in meadow land, lost most of them by the overgrowth of the grass; and the following winter, the mice, who avoid clean culture, destroyed the remainder. Every one was lost. A clean, mellow, cultivated piece of ground, kept so a few years, might have saved the whole of them, and brought them into bearing.

A chief reason of the fatal effects of sown crops, is the impossibility of mellowing the ground by repeated cultivation. For this reason, a low crop of peas has been found much worse than a heavy growth of Indian corn. A large peach orchard was sown with peas, and bordered on one side with corn, in which one row of the peach trees stood. Such was the benefit derived by them from the hoeing given to the corn, that the single row was most conspicuously visible by the deeper green of its foliage, at the distance of half a mile.

Low hoed crops have been recommended. But the more frequently the plow or cultivator passes among them, the greater will be the benefit to the tree. A friend, who well understands thorough cultivation, found that his young and newly planted standards which stood among the small seedling trees of his nursery, and which received the benefit of constant and continued working till autumn, made twice the growth of those in a field of beets, and which was kept well hoed only through the early part of the season, or till the crop covered the ground. Some of the former made shoots the first year four feet in length. The best peach orchard for market crops in western New York, is kept mellow by deep and thorough tillage without any other crop, and the improved quality and amount of the fruit is found of greater consequence than any other product of the land. The same course is pursued with the best of the great peach orchards which supply the city of Philadelphia.

A very mistaken policy is the selection of uneven or stony ground for orchards, which cannot be cultivated or occupied with any thing else. The truth should be unalterably fixed on every farmer's mind, that the orchard

should have the best piece of land on the farm, so long as clean, thrifty trees, loaded with fair, large, and high-flavored fruit, are to be preferred to light crops of what is half grown and distorted, with deficient flavor; with the additional difference that the former may be brought into full bearing in one-third of the time required for the latter.

Note. In connexion with the cultivation of the soil, the restoration of trees of feeble growth will be much hastened, if the trunk and principal branches are scrubbed several times in a season, with a brush dipped in soap-suds, first scraping the bark, should it be rough or mossy.

CHAPTER IX

PRUNING.

PRUNING has two objects; one, to *promote vigorous growth* in older trees, and to lessen the number of branches, where they become so thick as to interfere with each other's full development, and retard or lessen the perfect ripening of fruit. This occurs with large apple trees, which have grown without care till the thick mass of branches and leaves present an almost impenetrable shade. The other object, is to *lessen the luxuriant growth* of young trees growing in rich soil, and to prevent the too rapid formation of the wood and leaves at the expense of the production of fruit;—the most familiar instance of which occurs in the summer pruning of hardy grapes, by pinching off the ends of the young shoots.

I. Fruits are acid in cold summers, and comparatively destitute of flavor. Forced fruit, grown in winter when there is little light, cannot compare in quality with that ripened under the full blaze of a summer's sun; and melons, grown in frames covered with mats, possess none of the luscious flavor of those cultivated in the open air. Hence the advantage of a free admission of light and air among the branches of fruit trees, instead of allowing them to be covered with a thick shade of leaves.

The utility of sun-light is shown by the difference between specimens of fruit on the same tree fully exposed to the solar rays, and in thick shade. Even the exposed side of the same apple is often found decidedly the highest-flavored. The rich acid of the Esopus Spitzenburgh, and the sugary sweetness of the Tallman Sweeting are more strikingly observable under the deep red skin of the one, and the brown sunny cheek of the other.

There is, however, more judgment needed in pruning large trees, than perhaps any other operation in their

management. It is next to impossible to give particular rules, as circumstances vary so much that no two trees are to be treated precisely alike. But, keeping steadily the objects of pruning in view,—the admission of light, the removal of crooked limbs, and the preservation of a handsome, *evenly distributed* top,—the careful operator can hardly do amiss.

The best practice, undoubtedly, is trimming moderately every year or two, as the trees may need it, which obviates the necessity of cutting away much at a time, or making large wounds by sawing off heavy branches.

In ordinary practice, it is carried to a much greater extent than the health of the tree, or the necessity of the case requires. The safer error of the two, is trimming too little. Small portions, frequently pruned off, are the utmost that are needed.

If judicious pruning is commenced early, and the growth of crooked or improperly crowded branches prevented by a timely removal of superabundant shoots, very little subsequent lopping will be necessary. Indeed, so much may be accomplished by early care, that some skilful cultivators have found it entirely needless to possess such a tool as a pruning-knife or pruning-saw, accomplishing all they desire by merely rubbing off the fresh shoots at the outset. The cutting off of large limbs should only be resorted to in cases of absolute necessity, or where trees have been for a long time neglected till they have become an impenetrable mass of brush.

In pruning standard trees, it should be observed, that the older they become, the more caution is requisite to effect a gradual and not a sudden reduction. With young trees, the case is quite different, where free trimming may be unhesitatingly adopted, particularly with such kinds as the peach, which quickly reproduce new branches. A familiar instance of the safety of pruning heavily quite young trees, occurs in the heading down of stocks to the inserted eye, after the operation of budding.

In heading large apple and pear trees, and especially the latter, *for the purpose of regrafting them*, it is quite necessary that it be done gradually, and in successive years. For,

if too many boughs are lopped at a time, a great number of young shoots will be emitted, which being of a tender growth are often eminently liable, if the tree be the pear, to the frost-blight. The renewing should commence at the top, otherwise the tree will be thrown up to too great a height, and should proceed downwards, till in successive years, the whole work is completed.

Pruning, for the purpose of letting in light on the leaves and growing fruit, is more essential in a high northern latitude than further south. It is found of more utility in New England than in Ohio, and still more essential in England, where many fruits, to be perfectly ripened, need the full exposure of wall training, and the reflection of wall heat.

The pruning of the peach by shortening-in, described on a future page, is totally different from that of the apple and pear, and must be performed with an unsparing hand.

The best mode to prune young trees in the nursery, is to cut off all the annual shoots in winter, close to the main stem. This gives the whole strength to the stem, and prevents large stiff branches, so discordant with a handsome, clean tree. The side shoots which are thrown out, sufficiently stiffen the tree, and if the ends of these shoots are shortened in summer, in a greater or less degree, varying with the degree of stoutness or "stockiness" desired, it will throw all the growth into the main stem. Keeping the tree trimmed closely in summer, makes it too slender.

Season for pruning. Thinning out the heads of old trees, or heading back for grafting, may be performed in autumn or winter; and on younger trees, just before midsummer, when, the tree being in a growing state, the operator can judge better of the shape the head is assuming, and act accordingly; and the wounds are soon healed by the new wood. Peach trees may be shortened back during winter, or if the climate is cold, early in spring.

A cheap application to the wounds in pruning, to shut out air and water, and prevent cracking and subsequent decay, is a mixture of tar and brick-dust. But a much better one is made by dissolving gum shellac in alcohol, so that it shall be of the consistence of paint. It is applied with great ease and rapidity, adheres firmly, keeps out the air, and

not being a heavy application, but only a thin coating, it offers no impediment to the forming-lip of the new growth as it closes over the wound. A bottle of this composition at all times at hand, would be found a great convenience. A shilling's worth of gum shellac dissolved in a quart of alcohol, is all that is necessary, and is immediately ready for use. If too thick, it is at once rendered more liquid by the addition of alcohol, and vice versa. The most convenient way to use it, so that it may be instantly ready at all times, is to fit into the cork of a large-mouthed bottle, a brush of convenient size, the cork thus forming a sort of handle to the brush, which remains within the bottle when not in use.

II. PRUNING TO PROMOTE FRUITFULNESS.

The principles of this mode of pruning will perhaps be best understood by a detail of the operation:

In the early part of summer, or when the shoots have grown about one foot, cut off about one inch from their growing points; the sap, in consequence, no longer expends itself to increase their length in the formation of useless wood but is directed to the production of fruit. Cutting back to within two or three buds of the base, as often done, is objectionable, as not enough leaves are left for the elaboration of sap, and to support the healthy functions of the tree; and this sudden diminution, induces the remaining buds to make an effort to replace them by a second growth of leaves.

In two or three weeks, give the trees a second examination, and where shoots are too crowded, thin them out by cutting back so as to leave two or three buds at the base of each. Again, near the close of summer, or early in autumn, when the fruit requires more sun-light, and when there will be no danger of the remaining buds being stimulated to growth, and when the leaves have nearly completed their office, cut all the shoots back to two or three good buds. By this mode, no half-ripened shoots, of mid-summer growth, will be produced, but all will be strong, well matured, and vigorous.

The skilful operator will, however, avoid the extreme of too much denuding the tree of leaves; for they are at all times indispensable to the ripening as well as the growth of the fruit. An analogous case may serve to illustrate this

effect, in the practice of lopping early in autumn the stalks of Indian corn immediately above the ear; which, by careful measurement, has been found materially to lessen the crop.

A common method in France, is to allow all shoots to start, and pinch off their ends when they are only a few inches in length. In this way they all subsequently become fruit bearers, without crowding the tree with a confused mass of branches, like those of a sheared hedge. This shortening of the young green shoots, is found much superior to the practice of leaving them till winter. It should be commenced at the top first, and so proceed downwards as the season advances, for the lower shoots always have a tendency to be the weakest. A second and further shortening of the upper shoots, is often needed to preserve a proper balance between the upper and lower parts.

Pyramidal Trees. A neat and convenient mode of planting the sides of large walks, on cultivated ground, preferable in most cases to espaliers, because less adverse to a natural growth, and hence better adapted to the warm summers of America, where highly artificial modes of training are less needed, is by the use of trees trained as *pyramids*.

Fig. 46.—*Pyramidal Tree.*

For this purpose the trees are usually grafted on dwarf stocks, and are placed at distances of six to twelve feet asunder. The first year's growth from the graft or bud, is headed down to within about six good buds of its base; these buds, as a consequence, grow vigorously. About midsummer, their growth, with the exception of the upper one, is stopped by cutting off their tips, or by bending and tying them downwards. The upper or leading shoot, then grows with great vigor, and soon needs stopping again, to induce the emission of a second tier of shoots about one foot higher, which are treated as the former. This process is repeated for suc-

cessive years, till the tree has attained its desired height. The side branches will throw out shoots, which must be cut back, as already described for summer pruning, so as to form a handsome pyramidal tree.

This mode of pruning is usually adopted for dwarf pear trees on quince stocks, but it need not necessarily be confined to these; applied to the pear on pear stocks, and other fruit trees, it will promote in a high degree its early fruitfulness.

These rules for summer pruning, will be found of much utility if applied to the operation, necessarily more common in this country, of pruning hardy grapes.

It will be distinctly observed, that these remarks do not apply to standard trees, but only to those artificially trained in the form of espaliers or pyramids. But it might be adopted to a certain extent for standards, to give them a better head, and bring them into earlier bearing.*

* The particular modes in which pruning and training are applied to various kinds of fruit trees, will be found described on the pages which separately treat of those fruits.

CHAPTER X

CAUSES OF FRUITFULNESS.

WHATEVER tends to a rapid circulation of the sap, and to increase the growth of a tree, causes also the formation of leaf buds instead of flower buds. On the contrary, whatever tends to an accumulation of sap in any part, or to retard its circulation, induces the production of flower instead of leaf buds. When trees are young, and the bark and wood soft and flexible, the sap flows freely and without check; hence, leaf buds and the vigorous growth of branches are the result; but as trees become older, and the bark and other parts more rigid, they offer more resistance to a free circulation, and hence the production of flowers and the consequent fruitfulness of the tree.

This principle enables us to apply artificial means at pleasure for the promotion of the same object. When trees are young and small, a rapid growth and the attainment of size is desirable, which is given by enriching the ground, and by thorough and constant cultivation. A neglect of these operations, would check free growth and circulation, and cause the tree to bear. This would, however, be at the expense of the future vigor and size of the tree, and of the size and excellence of the fruit. Indeed, it often happens, that with the best treatment, trees will bear as young as their ultimate success requires.

There are, however, some varieties, which, in rich soil, continue growing a long time in an unproductive state. Fruitfulness is caused in various ways. 1. *By neglecting cultivation*, or suffering grass to grow under them, which diminishes their growth. 2. *Pruning the roots* beneath the surface, by cutting off a part of the larger ones, causing the same result. 3. *Ringing the branches*, or removing a small ring of bark round them, which prevents the fluids from

flowing back or downwards, and consequently induces their accumulation, to the formation of flower buds. 4. *Bending the branches downwards*, causing a similar accumulation with a like result. 5. *Grafting on dissimilar stocks*, which prevents a free flow of sap and juices at the point of junction.

1. Suffering grass to grow among trees, though beneficial in some very rare instances, is not on the whole advisable. The loss in the quality of the fruit is too great, and is not balanced by the advantages. The complaint of unfruitfulness has been frequently applied to the pear; but a selection of those sorts which bear while yet very young, entirely obviates the difficulty.

2. *Pruning the roots.*—This has been tried to a very limited extent only. Its utility may therefore be doubted under ordinary circumstances, for long continued practice. For such varieties, however, as incline to unproductiveness, and in the deep and highly manured soils of the most fertile gardens, it has proved eminently successful. Its tendency is to render trees more dwarfish, and for this reason it may be used to advantage upon such varieties of the pear as cannot be worked upon the quince, where the object is to produce early fruitfulness in connection with diminutive growth. It should be attempted, however, in no case, except in connexion with a deep, rich soil, and with the best cultivation.

There is no doubt that it is better suited to a northern, moist climate, such as that of England, than to the hotter and drier portions of the United States. It is usually performed with a spade, ground sharp, and thrust down through the soil at a suitable distance from the tree.

3. *Ringing the branches* is effected by taking out a narrow ring of bark, extending round the branch. By obstructing the downward descent of the juices, and by their accumulation above the ring, it not only causes fruitfulness, but frequently alters the appearance and quality of the fruit. In some cases, it has doubled the size; in others it has brightened the colors. In the Court Pendu apple, the colors are changed from green and dull red, to brilliant yellow and scarlet. But Lindley says, "If performed extensively upon a tree, it is apt, if not to kill it, to render it incurably unhealthy; for if the rings are not sufficiently wide to cut off all communication between the upper and lower lips of the

wound, they produce little effect, and if they are they are difficult to heal. For these reasons, the operation is but little employed."*

4. *Bending the branches downwards*, by changing their natural position, as well as causing a partial obstruction where bent, promotes their fruitfulness.

In all these modes, it must be remembered that the desired result will not be produced at once, as the first year is occupied in the formation of flower buds; and the next in their growth into fruit. This delay, however, will not take place, where the difficulty consists merely in the fruit *not setting*, the buds being already formed.

5. *The influence of the stock*, when it differs in nature from the graft, is often of importance. The more widely they differ, the greater will be the effect. Thus, when pears grow upon pears, the effect is the same as when not grafted at all. But pears on quinces are attended with an increase of fertility. Hence the adoption of the quince stock.

These artificial modes of inducing fruitfulness are not to be recommended for general practice, nor for orchard culture. It is true that trees will yield fruit sooner; but heavy crops from young growing [redacted]re not often desirable. Let them grow freely for [redacted]ears, and the amount ultimately obtained will be the greater. Indeed, the period of fruitfulness is often hastened by cultivation and retarded by neglect. Except for the sake of experiment, the preceding modes are not to be applied until trees are large, when good varieties will bear sufficiently without them.

* "Many years ago," says David Thomas, "I had a tree of the Mammoth Sweeting, which had two principal branches. It comes into bearing very tardily, and I became impatient to see the fruit. I therefore drew my knife and cut through the bark transversely, forcing open the bark by straining the knife sideways, as I drew it along an inch or so at a time; so that when the ring round the branch was completed, it had a zigzag appearance. Observe, that no bark was cut out, though the wood was scraped. This operation was very effectual however. The next season that branch bore plentifully, while the other branch remained as unproductive as before. The cutting never appeared to injure the branch."

CHAPTER XI.

IMPLEMENTS, ETC.

THE more common tools needed, are the shovel, the spade, and the hoe, for digging holes, transplanting, and cultivating the ground. The rake is useful in mixing manures with the soil for filling the remote parts or large holes.

INSTRUMENTS.

The *pruning-knife*, fig. 47, is a large hooked knife, for removing useless branches. The *pruning-saw* is needed in taking off larger limbs; attached to a handle several feet long, it will reach those at a distance from the ground. The direction of the teeth should be the reverse of the common saw; that is, they should point towards the operator, constituting what is called the *draw-saw*, fig. 48. Being thus only subject to a *pulling* strain, it does not require so thick a blade as a *thrust-saw*, with the teeth in the usual way. For this reason, it is less liable to become broken or twisted. The *bow-saw*, fig. 49, is a light saw for cutting near the ground.

Fig. 47.

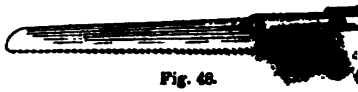


Fig. 48.

Fig. 49.

The *pruning-chisel* may differ but little from those of a common carpenter, fixed to the end of a long pole or handle, for cutting off small branches at a considerable height. It is placed against a limb, and the stroke of a mallet separates it.

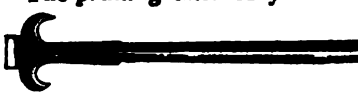


Fig. 50.

Small sheets are removed by the hooked part, shown in fig. 50.

The *budding-knife*, fig. 51, should have a broad, flat blade, the edge of which is to be rounded outwards, for the more ready incision of the bark. The thin ivory blade or *haft* at the extremity of the handle, as the budding-knife is commonly made, may be dispensed with in nearly all cases, the bud when set in, lifting the bark as it slides downwards, more perfectly than by any other mode, after the corners of the bark are lifted with the point of the blade.

Fig. 51.

The *grafting-tool* (fig. 52) is useful in cleft-grafting large apple trees. It may be made of iron, the edge set with steel. It is used for splitting the stock, after it is sawed off and pared. The part *a* should be two inches broad with a sharp edge, which should curve inwards, that the bark, in splitting, may be cut first, to give it a smooth flat face. The wedge *b* opens the stock to receive the graft. By the hook *c* it is hung on a twig close at hand, when not in use. Grafting wedges for common use, may be made by grinding down large cut nails.

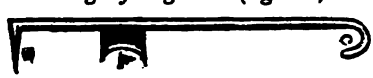


Fig. 52.

The *grafting-shears*, a recent invention, have effected a great improvement in cleft-grafting, rendering the work much more expeditious and perfect. They consist of a short thin blade of the best steel, *a*, fig. 53, two or three inches long, set at an angle of about a hundred and twenty degrees with the handle *b*, which moves it against a concave bed in the wooden piece, *c*. The angle which the blade and its bed form with the handles, imparts a *sawing* motion to the knife, which renders it more effective. It may be used on stocks an inch or an inch and a half in diameter. Pressing the top of the stock from the operator with one hand, it is cut off with remarkable ease by a single

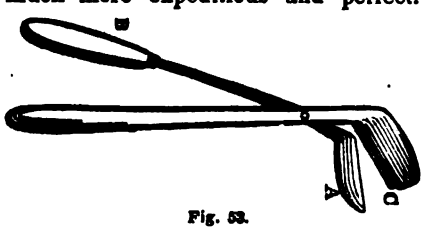


Fig. 53.

stroke given to the shears with the other hand. Another perpendicular stroke slits the stock for the graft, leaving a perfectly smooth face cut for its reception. The expedition and perfection of the work is thus greatly facilitated.

Small *shears attached to a pole* and worked by a cord, (fig. 54,) are useful for cutting grafts on tall trees; in removing the eggs of caterpillars, (see chapter on the apple;) and in taking off fine fruit to prevent bruising, by attaching a basket to the pole immediately under the shears. The blades of these shears, forming an oblique angle with the shaft at a little distance above the pivot, make a *draw-cut* instead of a *crushing-cut*, and are for this reason more effective. Apples, and some of the harder fruits, may also be gathered with a wooden hook in the end of a pole, to draw the fruit from the branch, caught in a basket just underneath.

Fig. 54.

In using the long handled pruning-saw, the pruning-chisel, the graft-cutter, or the fruit-gatherer, the operator may stand on a ladder or high stool, as an additional assistance in reaching the higher parts of the tree.

Self-sustaining fruit-ladders are very useful in gathering fine fruit, to prevent mutilation and bruising of the bark and branches. Fig. 55, is one of small size and simple construction, is easily carried in one hand, and will raise one's feet a yard or more from the ground. It consists of a small piece of light plank at the top, supported on legs not larger than common chair legs. Fig. 56, represents one from eight to twelve feet high, the two single legs moving on joints, for closing against the ladder in carrying, and spreading like a tripod in setting up under the tree.

Fig. 55.

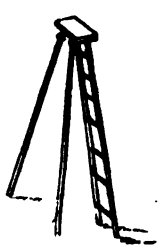


Fig. 56.

The *folding-ladder* may be closed together with the facility of a pair of compasses; it then becomes a round stick, easily carried in one hand. It is made of strong light wood, and its construction may be

readily understood by the annexed figure, (57,) representing the ladder as open, as half closed, and as closely shut. An enlarged longitudinal section shows the manner in which the rounds lie in the grooves or concave beds in the sides or styles; above which is a cross-section exhibiting the semi-oval form of the styles. The ends of the rounds turn on iron pins, slightly riveted outside. The rounds resting on shoulders, when the ladder is opened, render the whole stiff and firm. A ladder of this construction is found very useful, not only in fruit-houses, where a common ladder could not be conveniently carried, but in pruning standard trees, because it can be thrust through the branches like a round pole, without the least difficulty, and when once there, it is easily opened.

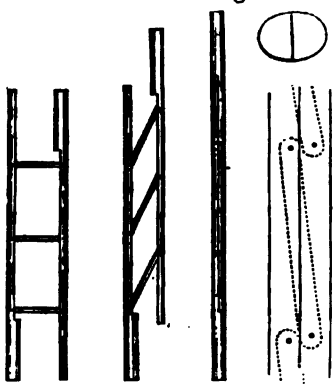


Fig. 57.

The *orchardist's hook* consists of a light rod, with an iron hook at one end, and a piece of wood made to slide along it. In using it the fruit-gatherer draws down the end of a branch with the hook, and fastens it by the sliding piece to another branch below. The slider passes freely along the rod, but ceases to slide by the friction of the side-strain whenever it is in use, fig. 58.

Fig. 58.

TRELLIS, *for grapes and espaliers.* Cedar, or other durable posts should be used, set four or eight feet apart. The horizontal bars or strips should be *let in* the posts, and should be from six to twelve inches apart.

NET SCREENS are useful in preventing the attack of birds on rare and valuable fruits on young trees. The net should be dipped in tan to prevent mildew when rolled up wet.

LABELS for standard trees are useful in retaining the names of the varieties. Purchasers of trees usually neglect

the names, and the labels received with the trees being soon lost, nothing more is thought of them till they begin to bear. Curiosity is then excited to know the "new kinds." Conjecture is set on foot, and the greatest confusion follows. Serious and innumerable mistakes are made and perpetuated in this way in all parts of the country.

Permanent labels are therefore important and necessary. The simplest is made of a slip of wood, three inches long and half an inch wide, suspended to the branch by a loop of wire, of which copper is best, fig. 59. The name will last three or four years, if written with a pencil on a very thin coat of fresh white paint. Better and more durable labels are made of small pieces of sheet-zinc, written upon with a mixture of two parts (by weight) of verdegris, two of sal-ammoniac, one of lamp-black, and thirty of water. The ingredients are to be mixed in a mortar with a small portion of water at first, and the whole added afterwards. Preserve the mixture in a well corked bottle, shaking it repeatedly at first, and keep the cork downwards to prevent the escape of ammonia, and it will remain fit for use for years.

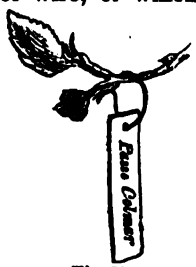


Fig. 59.

If the pieces of zinc are suspended by copper wire, it should be firmly twisted round the zinc so as not to remain loose (fig. 60,) or else the constant motion from wind, will soon wear off the wire. The wire should be nearly as large as a small knitting needle, to prevent cracking off by long use. The loop should be large, and pass round a side-shoot, instead of a main branch to prevent the danger of cutting in by the growth of the tree; and should be attached below a small fork, to prevent its blowing off the end of the branch.

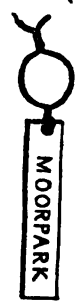


Fig. 60.

The wire may be wholly dispensed with by the following contrivance: cut the zinc into long triangular strips, half an inch wide and six to ten inches long. Draw the narrow or slender end round the twig, bring it through a hole punched mid-way between the ends, and clinch or twist it with the

fingers or a small pair of pinchers. These labels may be cut and punched by a tinman at a cheap rate.

Sheet tin may be used instead of zinc, using a sharp awl to write the name, and being particular to cut through the tin coating. Oxidation soon renders the letters distinct.

Lead labels, (fig. 60,) stamped with type, and suspended with copper wire, well twisted against the hole, to prevent wearing by the motion of the wind, are very durable. Fig. 61, shows the mode of stamping, by sliding the sheet lead between two plates of iron, *a*, *b*, screwed together, and setting the types successively against the upper plate, *a*, and stamping one at a time. The letters are thus kept in a straight line. The imprinted end of the sheet lead is then cut off, and forms the label.*

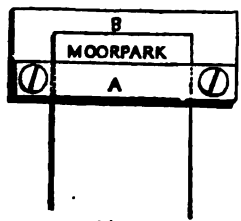


Fig. 61.

No person, who plants an orchard or fruit garden, should depend wholly on labels, which may be lost off, to distinguish the names of his trees. The rows, and the kinds in each row, should be registered in successive order, in a book kept for the purpose. This will facilitate the replacement of any lost label.

* It is sometimes a matter of convenience to mark the names on specimens of the fruit itself. This is quickly and permanently done by tracing the name with a blunt stick, or a pencil, pressing hard enough to indent the surface, but not to tear the skin. It succeeds best on pears, the writing soon changing color and becoming conspicuous.

CHAPTER XII.

TERMS USED IN DESCRIBING FRUITS.

It is only by a uniform and definite use of terms, that descriptions can be made intelligible to the reader. A full explanation of these terms hence becomes a matter of importance. Distinctive characters should be permanent, and not liable to variation with a change of locality, soil, season, or climate; or, if variable, the nature of such variation should be distinctly pointed out. To assist the cultivator the more fully to understand written descriptions, the devotion of a few pages to a clear explanation of the terms used in this work, may prove useful.

I. Growth of the tree, shoots, and leaves.

The form of growth often affords a good distinctive character of varieties, not liable to great variation. Young trees, only a few years old, usually exhibit peculiarities of growth more conspicuously, than old trees, of irregular spreading branches. Hence, in all cases, where this character is mentioned, it refers to young trees not more than three or four years from the bud or graft, unless otherwise expressed.

1. Shoots are *erect*, when they rise nearly perpendicularly from the main trunk or stem, as in the Early Strawberry apple and Bartlett pear, fig. 62.

Diverging, when they deviate from the perpendicular at an angle of about forty-five degrees, considerable variation being found in the same tree; as in the *Domine* and *Ribston Pippin*, fig. 63.

Spreading, when they more nearly approach a horizontal direction, as in most trees of the Rhode Island Greening, fig. 64.

Drooping, when they fall below the horizontal, a form

which many spreading shoots assume, as they grow into the large branches of older trees.

Ascending, when they curve upwards, as in the Gravenstein apple, and small Red Siberian Crab, fig. 65. Erect trees usually partake more or less of this quality, but the Early Harvest is free from it.

Irregular, when they assume no very distinct growth, but more or less a mixture of the preceding, as Black Gilliflower, and Summer Bonchretien pear.

Straggling, similar to the next preceding, but with shoots more slender and curved, as Winter Nelis and Black Worcester pear, fig. 66.

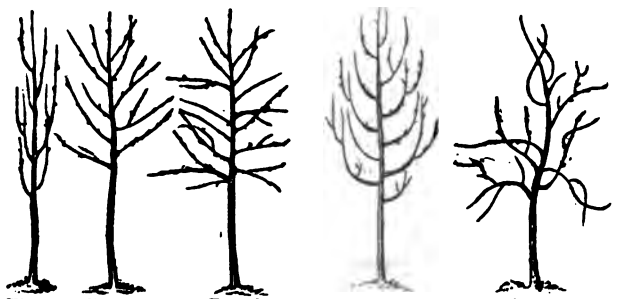


Fig. 62. Fig. 63. Fig. 64. Fig. 65. Fig. 66.

Shoots are *straight*, as in the Early Harvest and Northern Spy apples; *flexuous*, or more or less deviating from a straight line, as in the Swaar and Roxbury Russett. This distinction is very apparent and uniform in young and very thrifty trees, but not in older ones of feeble growth.

They are *stout*, as in the Red Astrachan; *slender*, as in the Jonathan apple, and Winter Nelis pear.

Trees with erect straight shoots when young, usually form more regular and compact heads in older trees; and those of a spreading habit, more irregular or drooping heads.

Some trees which grow very rapidly when young, are small when of full size, examples of which are found in the Late Strawberry and Tallman Sweeting. Others at first grow more slowly, but ultimately become large, as Esopus Spitzenburgh. Some varieties, again, continue

to increase rapidly in size at all periods, as the Northern Spy; while others of feeble growth when small, never attain much magnitude, as the Early Joe and Sine Qua Non.

2. THE COLOR of the shoots varies greatly in the same variety at different periods of the year, as well as with different degrees of exposure to the sun, and with a change of soil, climate, and season. When fresh or very young, all have a greenish color, but gradually assume various shades of yellow, olive, brown, red, purple, and nearly black, as the season advances, and as they become bare and are exposed to the sun and weather. For this reason, in describing the color, the terms must be relative, and can only be correctly applied by a comparison at the time with the color of other sorts. During winter, and early in the spring, the shoots of most trees become so much darker than at other times, that it is only practice and by placing the different sorts side by side, that accuracy may be attained. Skilful culturists will readily distinguish, by a glance at the color of the shoots, many of the kinds they cultivate; but the peculiar cast is hard to describe in words, in the same way that it is impossible to describe the handwriting of an individual, so as to be known from fifty others, although many can, at a glance, know the penmanship of hundreds of different persons. A few of the most strongly marked cases, however, present peculiarities of color, which form useful points of distinction. No one, for instance, could easily mistake the *yellow* shoots of the Bartlett and Dix pears, for the dark brown or purple of the Tyson and Forelle; or the light greenish cast of the Bough and Sine Qua Non apples, for the dark color of the Northern Spy, or dark brown of the Baldwin; nor the downy or greyish appearance of the Ladies' Sweeting and Esopus Spitzenburgh, for the clear shining brown of the Gravenstein and Red Astrachan.*

3. THE BUDS sometimes afford distinct characteristics. As examples, the large, compact, and projecting buds of the summer Bonchretien, always contrast strongly with the smaller, more rounded, and softer buds of the Madeleine.

* Nearly all shoots are more or less downy at first, but the down disappears as they grow older. Hence the term must be used relatively. In plums, the smooth, or downy shoots, afford in most cases good distinctive points.

Buds are large on the Swaar and Golden Sweet; small on the Tallman Sweeting and Rhode Island Greening.

4. The Leaves in a large number of instances, are of use in distinguishing different varieties.

They are *even*, (not wrinkled,) as in the Bartlett pear and Baldwin apple, fig. 67.

Fig. 67. Fig. 68 Fig. 69. Fig. 70. Fig. 71.

Waved, as in the Tallman Sweeting, and Beurré d'Aumalis pear, fig. 68.

Wrinkled, when the waves are shorter and more irregular, as in Green Sweet, fig. 69.

Flat, as in the Madeleine and Skinless pears, fig. 70.

Folded and recurved, as in the Easter Beurré and Bonchretien Fondante, fig. 71.

Large and wide as in the Red Astrachan and Huling's Superb.

Narrow, as in Dyer apple, and Van Mons Leon le Clerc pear.

Erect, as in Early Strawberry, fig. 72.

Drooping, as in Dominie, fig. 73. But these two last are indistinct characters, and only to be resorted to in a few very remarkable instances, as most leaves are erect on new shoots, and become spreading or drooping as they grow older.

Fig. 72. Fig. 73.

The *color* of the leaves may sometimes assist in description, as *light green* in the Yellow Bellflower and Rambo; *deep green*, as in the Rhode Island Greening; and *blueish green*, as in Peck's Pleasant.

The *serratures*, or *saw-teeth markings on the margins of leaves*, are characteristics of importance, in many varieties of the apple, and on the peach they are so well defined as

to form a basis of the classification of varieties. The latter will be found particularly described in the separate chapter on the peach.

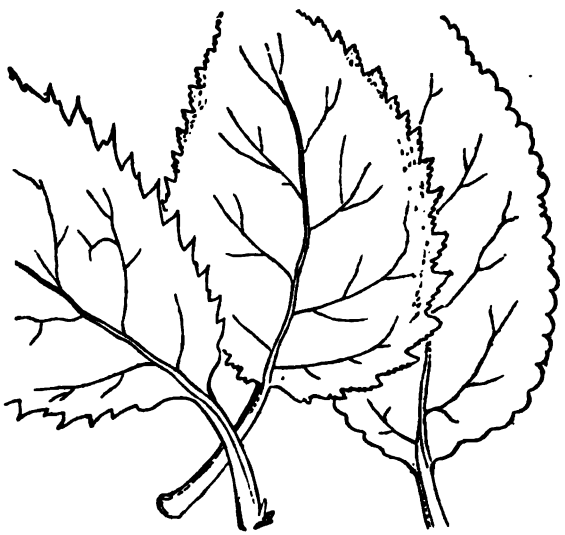
Leaves of apples are,

Serrate, or cut with teeth like those of a saw.

Sharply serrate, when every serrature ends in a sharp point, as in the Fall Pippin, fig. 74.

Doubly serrate, when the serratures themselves are again minutely serrated, as in the Vandevere and Drap d'Or, fig. 75.

Coarsely serrate, as in the Swaar.



74—Sharply Serrate. 75—Doubly Serrate. 76—Crenate.

Crenate, when the teeth are rounded, as in the Esopus Spitzenburgh, fig. 76.

Obtusely crenate, when the teeth are unusually rounded, as in the Bough.

Finely crenate, when the teeth are small, as in summer Queen.

When the serratures are partly rounded, and irregularly

and rather deeply cut, they become *toothed*, as in Ladies' Sweeting, fig. 77.

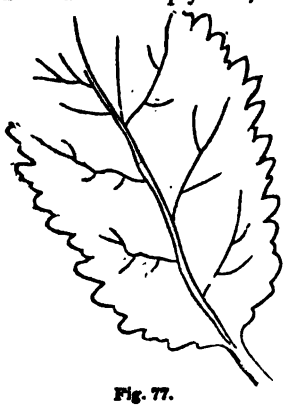


Fig. 77.

Many varieties present intermediate degrees, as,

Serrate-crenate, partaking somewhat of both, as Jersey Sweeting, Summer Rose.

Crenate-toothed, as in Bevan's Favorite.

Serrate, slightly approaching toothed, as in Rambo.

FLOWERS.—In apples, pears, cherries, and most other kinds, but little difference exists in the flowers. In the peach and nectarine, however, an important division in classification is made by the great difference between those with large and small petals; one class, including the Early Ann, Grosse Mignonne, and others, having large showy flowers; and another class, comprising Early Crawford, George IV., and many more, having flowers with small narrow petals.

II. FORM OF THE FRUIT.

In the following pages, the *base* of a fruit or any other part or production of a tree, is the portion towards the branch or root. This is in accordance with the language universally adopted in describing plants. It has, however, been more or less departed from in the common language used to describe fruits, and especially so as applicable to the pear. This deviation from scientific accuracy tends to confusion, and if simplicity of expression is sought, ambiguity must be avoided. The apex of the stalk of a fruit, however, to avoid the chance for a mistake, may in all cases be termed the *insertion*.

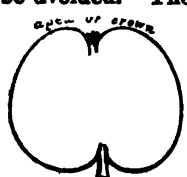


Fig. 78.

The term *apex* should be understood as applying to the part most remote from the branch or root. In fruits, it is the part opposite to the insertion of the stalk In pears, this part is usually denominated the *crown*.

The *axis* is a line connecting the base and apex.

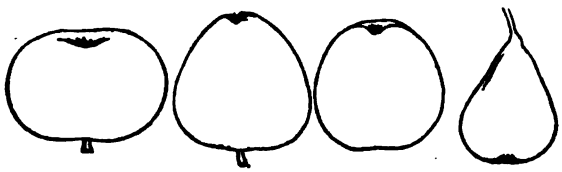
A *longitudinal section* is made by cutting an apple from base to apex.

A *transverse section*, by cutting it at right angles to the axis.

The *length* is the longitudinal diameter; the *breadth*, the transverse diameter.

A fruit is *round* when nearly spherical, as Fameuse, Green Sweet.

Roundish, when varying slightly from round, or when the length and breadth are nearly equal, as Dyer and Gravenstein.



79—Oblate. 80—Conical. 81—Ovate. 82—Obconic.

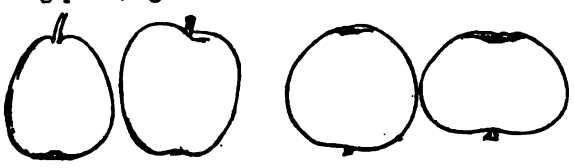
Oblate, *flat*, or *flattened*, when the height is much less than the breadth, as Rambo, Maiden's Blush, fig. 79.

Conical, when tapering from the base to the apex, as Bullock's Pippin, fig. 80.

Ovate, or egg-shaped, when the length rather exceeds the breadth, with a rounded taper from base to apex, as in Esopus Spitzenburgh, fig. 81.

Obconic,* or reversed conical, when the smaller end is at the base or stalk, as in the Tyson pear, fig. 82.

Obovate, or reversed ovate, is when the smaller end of an egg-shaped fruit is at the base, as the Buffum and Dearborn Seedling pears, fig. 83.



83—Obovate. 84—Oblong. 85—Round-ovate. 86—Oblate-conical.

Oblong, when the length exceeds the breadth, and the

* This term is chiefly applied to pears, and is nearly equivalent to pyramidal, but a more precise in its meaning.

sides are nearly parallel, as Kaighn's Spitzenburgh, fig. 84.

Obtuse, when the parts are rounded or blunt.

Acute, when any part, as the neck of a pear, tapers to nearly a point.

Fruits may partake of forms variously combined, as,

Round-ovate, when nearly round, with a slight rounded taper to apex, as Lady's Sweeting, fig. 85.

Round-conical, nearly the same as the last, but with the taper less rounded.

Oblong-conical, as Yellow Bellflower.

Oblong-ovate, as Black Gilliflower.

Oblate-conical, as Rhode Island Greening, and Hawthorndean, fig. 86.

Depressed, pressed down, sunk, or shortened, applied to the apex of peaches, strawberries, &c.

Flattened at the ends when the base and apex only are flattened, as Winter Pearmain. An oblong fruit, though not flat, may be flattened at ends; a conical fruit may be flattened at base.

Compressed, pressed together, when the sides are flattened, as in some apricots, plums, &c.

The CAVITY is the hollow in which the stalk or stem of a fruit is placed.

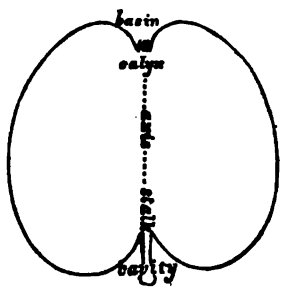


Fig. 90.

The BASIN is the depression which contains the calyx, eye, or remains of the blossom.

A cavity may be *shallow*, *narrow*, *deep*, or *broad*.

It may be *obtuse*, or somewhat blunt or rounded at bottom, as in the Petre pear and Pomme Grise apple, fig. 87.

Acute, when simply ending in a sharp point at bottom, as Baldwin, fig. 88.

Acuminate, when ending in a long drawn out taper, as Fall Pippin, fig. 89. The Holland and Fall Pippin are distinguished from each other by the rather obtuse cavity of the former, and acuminate cavity of the latter.

The BASIN is always narrow in any fruit having a narrow

Fig. 87—Obtuse. Fig. 89. Fig. 89.

or pointed apex, fig. 90; it is usually wide in fruits having a wide or obtuse apex, as Rambo, fig. 91; but where the rim or boundary is broad and obtuse, the basin may be narrow, as in the St. Lawrence and Gravenstein, fig. 92.

It is *distinct* when well defined.

Abrupt, when the depression breaks off suddenly from the rim, fig. 93.

Fig. 90. Fig. 91. Fig. 92. Fig. 93.

Even, when not furrowed or wrinkled.

Angular, with several corners.

Wrinkled, having small irregular hollows and ridges.

Waved, with gentle and irregular undulations of surface.

Furrowed, when more regularly channelled.

Plaited, having small, straight, and regular ridges.

Ribbed, with larger and more obtuse or rounded ridges.

The peculiar forms of PEARS render some additional terms necessary:

Many pears have a *neck*, or narrower part towards the stalk, and a *body*, or larger part towards the crown, fig. 94.

They are distinctly *pyriform*, when the sides formed by the body and neck, are more or less concave or hollowed in, as in fig. 94, shown by the dotted lines.

Turbinate, or top-shaped, when the body is nearly round, and a short rounded acute neck, as in the Bloodgood, fig. 95.

The form of different pears is further distinguished by the form of the different parts:

The neck may be *long*, as in Calebasse.

Narrow, as in Beurré Bosc, fig. 96.

Short, as in Glout Morceau, fig. 97.

Obtuse, as in Bartlett.

Acute, as in Jargonelle, fig. 98.

Fig. 94. Fig. 95. Fig. 96. Fig. 97. Fig. 98.

Obconic, as in Capiaumont.

Distinct, as in Beurré Bosc.

Obscure, as in Seckel.

The body may be *heavy* or *large*, when greatly exceeding in size the neck, as Catillac.

Light or *small*, when not much larger than the neck, as Washington; in which case the fruit approaches oblong in form.

Oblate, or flattish, as in Frederick of Wurtemburg.

Round, as in Jargonelle.

Conical, as in Vicar of Winkfield.

Ovate, as in Marie Louise.*

CHERRIES may be *round*, *cordate* or heart shaped, or *ovate*.

STONE FRUITS usually have a furrow on one side, extending from the stalk to the apex, termed a *suture*, (literally meaning a *seam*,) which sometimes occurs on both sides. It is *large*, when wide and deep; *distinct*, when clear or well defined; *obscure*, when faint; *obsolete*, when not existing, or only a faint line on the surface.

COLOR OF FRUIT.—The lightest colored fruit is white, as the Snow peach; next, yellowish white; pale yellow; yel-

* Cultivation influences considerably the form of pears. Thus, on a young thrifty tree, the Seckel pear has a slight neck; on an old heavily laden tree, the neck is obsolete. The body, when ovate or slightly conical on young trees, becomes rounded on older trees, and even flattened in rare instances.

low; and deep yellow. The addition of red produces successively, orange yellow, orange, orange red, rich warm red. Shades of red, clear red, crimson when darkened, purple when blue is added, violet, less blue than in purple. Amber is a very light yellowish brown. Fawn color is a light reddish brown, with a slight admixture of grey.

A fruit is *striped*, when in alternating broad lines of color;

Streaked, when the lines are long and narrow;

Marbled, when the stripes are wide, faint, irregular or waving;

Blotched, of different abrupt shades, without any order or regularity;

Clouded, when the blotches are broader and more softly shaded;

Stained, the lighter shades of a blotched or clouded apple;

Splashed, when the stripes are much broken and all sizes;

Mottled, covered with nearly confluent dots;

Dotted, when these dots are more distinct;

Spotted, when the dots become larger.

Texture of Fruit. *Hard*, those which need the artificial aid of cooking to soften them sufficiently, as the Catillac pear.

Breaking, when tenderer than the preceding, but not yielding to the simple pressure of the mouth, as Summer Bonchretien.

Buttery, when the flesh forms a soft mass, yielding to the pressure of the mouth, as in the White Doyenné and Seckel pears.

Melting, when the flesh becomes nearly or entirely liquid by this pressure, as in the Madeleine. These qualities may be combined, as breaking and melting, in the Washington; breaking and buttery, in the Onondaga; buttery and melting, in the Tyson, and in most of the best varieties of the pear.

The texture may be fine, granular, coarse, gritty, fibrous, tough, crisp, or tender.

The Flavor may be *sweet*, *neutral*, *slightly sub-acid*, or mild sub-acid, *sub-acid*, *acid*, *very acid*, or *austere*; *aromat*

or spicy; *perfumed* or possessing odor and with more or less of a shade of musk; *astringent*, usually a defect, but sometimes an excellent quality, if in a very minute proportion; *rough*, astringent and austere; *vinous*, rich, high-flavored, and rather acid; *sugary* or saccharine, sometimes nearly sweet, possessing the qualities of sugar, which may be mixed with acid.

THE QUALITY is designated by *first*, *second*, and *third* rates; and fruits perfectly worthless by still lower grades. A second rate fruit, to be worthy of cultivation, must possess other good qualities in a high degree, as hardiness, productiveness, fair appearance, &c. Very few fruits as low as third rate, can ever be worth retaining, and only for extreme earliness or other uncommon quality. Fruits that possess desirable qualities, are usually designated by three degrees of flavor; the lowest, including the best of second rate fruits, or "good second rate," are termed *good*; the lower grade of first rate fruits are termed *very good*, or *fine*; and the highest quality of all, are *best*, *very fine*, or *excellent*. Examples,—Maiden's Blush apple, Napoleon pear, Lombard plum, and Crawford's Early peach, are *good*; Rhode Island Greening, Bartlett pear, Graffion or Bigarreau cherry, and Red Gage plum, are *very good* or *fine*; and Swaar apple, Seckel pear, Downton cherry, and Green Gage plum, are *excellent* or *best*.

PART II.

ON THE

DIFFERENT KINDS OF FRUITS.

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THROUGHOUT the following part of this work, to enable the reader to perceive at a glance, the character and quality of a fruit, without the trouble of reading every separate description, the different degrees of excellence are indicated by the type used for the name. Those varieties which have been admitted as eminently worthy of cultivation, by a large vote in many different parts of the country, are printed in LARGE CAPITALS; those next in quality and value, and in nearly all cases fruits of first quality, are designated by SMALL CAPITALS; those worthy of a place only in large collections, or whose character has not yet been fully established, are in *Italics;* while such as have been superseded or are unworthy of cultivation except on the trial grounds of the Pomologist, are in common Roman type. A few new varieties of high excellence, which promise to become general favorities, are given in *ITALIC CAPITALS.*

It is scarcely necessary to remark that the task of thus classing the numerous varieties, is one of extraordinary difficulty. The diversities of tastes, the changes wrought by soil, culture, and climate, and the different estimates placed upon delicious flavor alone, productiveness, handsome appearance, early maturity or long keeping, would wholly preclude entire unanimity in any one case. The author has endeavored to weigh properly all the different objections and recommendations, according to the best information to be obtained; and in this labor he has been generously assisted by several of the most eminent Pomologists of the country.

It has been the aim to admit, in no instance, any new variety, that cannot deservedly rank among those of high excellence; all others being such as have either been known by extensive dissemination or by descriptions in books.

NAMES AND SYNONYMS. When more than one name for a single variety has been widely known, it has been the aim of the author to select the one most commonly used. For this reason, those adopted in Downing's "Fruits and Fruit Trees of America," have in nearly all cases been retained, a work more extensively circulated than any of a similar character.

It happens, in some instances, that the original or correct name may have been for a long time partly or wholly thrown aside and a new one substituted; thus, William's Bonchretien has given way to the name Bartlett; Pomme Royal to Dyer; Epargne to Jargonelle; Williams to William's Favorite. In such cases, it can be hardly proper to tax the whole community to make a change, to rectify the error of an individual; and the more common name has been retained. A pomological writer, like the compiler of a dictionary, should confine himself as nearly as practicable to general usage, and not to the manufacture of new names. Old and popular names, as Bough and Pennock, have hence been preferred to the newer ones of Large Yellow Bough and Pennock's Red Winter.

In a few instances, however, to prevent mistake or confusion, it becomes necessary to choose the appellation the less widely known. Preference is also given to English names. Thus, the example of Downing has been followed in the adoption of such names as Blue Gage, Purple Gage, and Echassery, as used by Lindley, instead of Azure Hative, Reine Claude Violette, and Echasserie, by Thompson. The course pursued with foreign names is more fully explained on a future page.

Cases of difficulty occur where usage differs with a change of locality. The fruit known as the Butter pear of Pennsylvania, the Virgalieu of New York, and the St. Michael of New England, evidently requiring a general name, the original European appellation of White Doyenné has been chosen. The Ortley or White Detroit apple, furnishes a similar case. Decisions can hardly be satisfactory to all parties, however carefully opposing claims may have been weighed; and the voice of the public at large can only finally settle such disputed questions.

CHAPTER I.

THE APPLE.

"THE APPLE," says Downing, "is the world-renowned fruit of temperate climates." Although less delicious than the peach or pear, it possesses, from its great hardiness, easy cultivation, productiveness, its long continuance through the whole twelve months, and various uses, an importance not equalled by any other fruit.

Its value as a table fruit, or for cooking, and its increasing importance as an article for exportation, are well known. But its great value and cheapness as food for domestic animals is very imperfectly comprehended or understood. Take for example, a brief estimate:—Where land is fifty dollars per acre, an acre of good productive apple trees may be planted and brought into bearing for as much more, making the entire cost one hundred dollars. These will yield, as an average, four hundred bushels annually, or ten bushels per tree, if the *best cultivation* is given. The annual interest of the orchard, at six per cent., is six dollars; the annual cultivation will not exceed six more, or twelve dollars as the cost of the whole crop on the trees, or three cents per bushel. In many fertile parts of the country, where one plowing and two or three harrowings each year would be all the cultivation needed, the cost of the ungathered crop would be only a cent and a half per bushel. The value of sweet apples for cattle and swine has proved to be fully equal to the best root crops. No land-owner need therefore fear to plant extensively, with a view of being furnished with a copious supply of food for domestic animals, needing not, like other crops, the yearly attention and care of procuring seed and planting.

PROPAGATION.

Raising the Seedlings. The seeds are most easily obtained from the pomace of cider mills. They will make the most thrifty plants, if the apples are selected from the most rapidly growing sorts. The pomace is to be broken up fine, in a large wash tub, mixed with water, stirred, and allowed to stand a few seconds, when the seeds will settle to the bottom, and the apple pulp is then racked off. A man will thus wash out half a bushel of seeds in a day. The clean seeds are more evenly and conveniently sown than in the pomace, which may be done either in autumn or spring. If not done till spring, they should be kept through the winter, mixed with clean, moist sand, or with fine peat or pulverised muck, and exposed to the frost, which will tend to split the exterior horny covering. If mixed with soil or loam, it will be more difficult to separate the seed in dropping.

The seeds may be sown in drills from one to two feet apart, to be kept clean with the hoe. Or where land can be afforded, they may be sown in wide drills, three feet apart, for the cultivator to pass between. When sown in the autumn, on soils which have a large admixture of clay, the seed should be covered with fine muck or peat, to prevent the formation of the crust on such soils, often so hard that the young plants cannot rise through it. A compost made of peat and one quarter of its bulk of ashes, is still better. If sown in the spring, the seed should be mostly covered with soil, with only a sprinkling of muck on the surface; otherwise the seeds or young plants may perish by becoming too dry before they are well established. A sprinkling of fine manure will accomplish nearly the same purpose.

The seedlings are treated in three different ways. They may be set out into nursery rows in the spring, when a year old, to be budded the second summer; they may be taken up and root-grafted as soon as large enough; or they may be planted into rows and grafted at any subsequent period.

1. *Budding.* When the young plants are vigorous and the land fertile, the budding may sometimes be done the first year after removal to the nursery rows, but usually the second summer will be found best, when the trees are of sufficient size, and in the highest state of vigor, and

when, as a consequence, the bark will separate freely, and the work be expeditious as well as sure of success. These are headed back the following spring, according to the treatment described in the chapter on budding.

2. *Root-grafting.* This is done by whip or tongue grafting, already described on a previous page. When performed on a large scale, by nurserymen, the season selected is the latter part of winter, and before the commencement of the usual spring operations. It is wholly performed within doors, and consequently the seedlings must be taken up the preceding autumn. Most of the part above ground is cut off, to save room, and they are then packed in tight boxes, to be secure from mice, in a common cellar. The usual practice is to fill the interstices among the roots with moist earth; but pulverised muck is better, as it admits a more easy separation of the trees, and they are less covered with grit, and more easily washed. Trees of two years' growth are usually quite large enough, and sometimes one-year seedlings will do.

When ready to commence grafting, roots enough for one day's work are taken, the side roots trimmed within about a quarter of an inch of the main root, and they are cut in pieces about four inches long; the upper piece may have a portion of the stem attached. They are then washed by stirring them in a pail of water, leaving them in the water, and taking out small quantities to dry, as wanted for use. Scions for half a day's work are then cut about four inches long, and a portion prepared for setting by cutting the usual slope and tongue at the lower end. The roots are then cut one by one in the same way, and the grafts inserted. The place of union is then covered with grafting wax. This may be applied, either directly in a melted state, with a small brush, which is best and most expeditious; or by rolling tightly round, a small strip of wax plaster. Tying with strings is wholly needless, if the grafting has been properly done by crowding the tongue and cleft closely together, so that the parts cannot be easily displaced. Wax for this purpose, being placed always beneath the surface of the soil, should be softer than for other grafting, to facilitate its more ready application, and to prevent any danger of scorching the bark by heating it in melting. A larger

portion of tallow or oil in the wax described under grafting, will accomplish this purpose.

When the grafting is completed, the grafted roots are to be packed away in boxes, till the ground opens. Raisin boxes, or those of similar size, will prove convenient. Fine mould or peat, from the box in which the roots were packed, is sprinkled over the bottom, the grafts are placed in, slanting, in successive layers, and all the spaces filled with mould or peat. A strip of board, with a length equal to the width of the box, to press against each successive layer while applying the mould, is found convenient. The mould should reach within an inch or two of the tops of the grafts, and should be compactly filled among them. During the whole of the work, each heap of grafts must be kept with a label, and every box sufficiently marked, to prevent all possibility of mistake.

It is a practice with many cultivators to place the boxes in so warm a place, that the grafts may make a growth of a few inches before setting out. But unless the soil is very favorable, the result is often unsuccessful. As a general rule, for all localities, the grafts should be set out as early as practicable in spring, and before they have made much growth.

Waxing is sometimes omitted; but in light or gravelly soils, and especially if dry weather succeeds, the omission is attended with great loss.

The most favorable soils, are rich, rather moist, and rather heavy loams. If light or gravelly, there is more danger from midsummer drouths, which often prove quite destructive. Grafting the whole root entire will much lessen the difficulty.

Fig. 100.

The grafts are most expeditiously set out with a dibble, or a sharp tool, shod with iron or steel, about an inch and a half in diameter, one stroke of which into the mellow soil forms a hole for the roots, and two or three lighter strokes press the earth closely about them. Fig. 100 represents a convenient form for this instrument, which may be made of the handle of a broken spade. Fig. 101 shows the graft and root, ready for setting out. To keep the whole moist, till sufficient growth takes place, the place of union between the root and graft

should be at least three inches below the surface. Especial care is needed to fill up closely the hole made by the tool, and that no cavity is left about the lower part of the root, which is sometimes done by the inexperienced workman.

Fig. 101.

The chief care afterwards is to keep the ground constantly cultivated, and perfectly clean, which will increase the growth during summer, and exclude mice in winter; the trees are to be trained up to one leading stem, not trimming so closely as to make them slender; they are to be kept straight, by tying them when necessary to upright stakes; and all destructive insects must be watched and destroyed.

If the ground is rich and kept perfectly clean, they will grow from one and a half to two feet the first summer after grafting; to three or four feet, the second summer; five to six or seven feet the third summer, when many of them will be large enough for removal to the orchard, and most of the remainder in one year more. If suffered to remain longer in the nursery, they should be taken up and set out again, for the purpose of shortening the long roots, without which subsequent transplanting would be attended with too great a check in the growth, if not actual danger to the tree.

Root grafting is extensively performed in large nurseries, but on unsuitable soils, budding is found the most certain of success, the buds being rarely destroyed, and only by the most unfavorable winters. The bud remaining dormant the first summer, the growth is one year later than on grafted stocks of the same age; but this difference is made up by the more rapid growth of the shoot from the bud, which is usually twice as great as that of a graft on the root. To obtain handsome and good trees, the bud should be set within two or three inches of the ground.

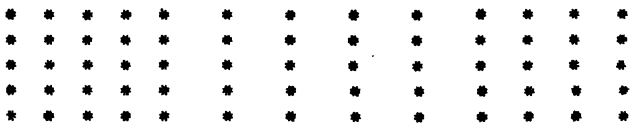
An industrious man will set and wax in a day 500 root grafts, or the same number of buds, tying them in for himself. If a careful boy ties the buds after him, 1000 per day will not be a severe task.

PLANTING ORCHARDS.

Soil. The apple is a vigorous and hardy tree, and will grow upon most soils. It does best however, on those tha

are deep, rich and fertile, such as will give good crops of Indian corn. Hard, shallow, and wet grounds are to be avoided. Improvement by manuring, and deep cultivation, is desirable, as a great difference in quality and productiveness results from a difference in fertility. The application of lime, where not abundant in the soil, is of great importance.

Distance. Where the quantity of ground is limited and in rare cases, trees may for a time stand within fifteen or twenty feet; but for large and permanent orchards they should not be nearer than thirty feet. There is however, a material difference in the size of varieties, hence a variation may be allowed. But this variation in distance should not break the rows which are to be preserved for convenience in cultivation. The rows may be kept entire, by varying the distance in one way only, as in the annexed figure. The middle portion is for trees of the largest size, as the Spitzenburgh, Fall Pippin, and Rhode Island Greening; those of smallest size, as Bough, Yellow Harvest and Sine Qua Non, are on the left; and those of middle growth, as the Swaar, Black Gilliflower, and Tallman Sweeting, are on the right.



This distinction in the size of the trees, is only necessary in the most extensive orchards.

Transplanting. Full directions have been given in a preceding chapter, where the superior advantages of broad, deep, and loose beds of earth, made by heavy subsoiling and manuring, have been pointed out; or in the absence of this excellent preparation, by digging large holes to be filled with rich mould, or manured surface-soil. This care is often thought unnecessary with so hardy a tree as the apple. But a just comparison of the two modes would exhibit its eminent advantages. Take, for instance, the least efficient of the two modes, that of digging large holes. A hundred holes, six feet in diameter, may be dug by a

man in eight days,—and filled with muck or rich mould in four days more; the cost with team, eleven dollars. A hundred small holes may be dug in four days; cost, three dollars; difference, against large holes, eight dollars. The trees planted in the large holes would probably yield with good attention, a bushel a tree, in five years, making 100 bushels; the sixth year 120 bushels; the seventh, 150; the eighth, 190; the ninth, 240; the tenth, 300; total 1000 bushels,—worth, at 20 cents, $200. The other would not probably produce 100 bushels in less than ten years, which would be worth $20. Difference in favor of large holes, $180, to balance $8, against them. Although the calculation cannot be precise, it is probably a tolerable approximation, and must appear moderate when the increased size of the trees and superiority of the crop for many years afterwards is taken into account.

The objection that such work must be done at a very busy season of the year, may be obviated by digging the holes and filling them at some other time.

CULTIVATION.

The importance of thorough cultivation, has been already noticed, and cannot be too well understood. If two specimens could be exhibited side by side, the one showing the stunted, lingering, mice-eaten and moss-covered trees, caused by neglect; and the other, the vigorous and thrifty growth, and the fair and abundant crops, resulting from fine and clean culture; none could fail to be satisfied of the superiority of the one and impolicy of the other.

RENOVATING AND PRUNING OLD ORCHARDS.

As soon as the first symptom of failure in old orchards appears, they should, in addition to good cultivation, be freely manured in connexion with the application of lime or leached ashes, as directed already under the head of *Special Manures*. The change which may be thus wrought, can hardly be understood by one who has not witnessed the result. The following experiment, similar in nature, but differing in the mode of performance, described by H. W. Rockwell, of Utica, N.Y., cannot fail to be interesting:*

* Horticulturist, Vol. II., p. 267.

"The experiment was performed upon three trees standing in my grounds, none of which were less than *thirty years* old. One of these trees, an old-fashioned [Newtown] Pippin, and a great favorite, had borne moderately; the other two made out between them, to "get up" about a dozen apples a year, just to let me know, I presume, that they "could do it," but were perfectly indifferent *how* it was done.

"I, last summer, undertook the renovation of these trees. For this purpose, I opened between them trenches, say ten feet in length, two feet in depth, and about eight feet equidistant from tree to tree. The roots which were encountered in this operation, were, of course, all cut off, the trenches filled with *well rotted manure*, and closed. I finished by giving each of the trees about a peck of charcoal mixed with the same quantity of ashes, and now for the result. I have this year gathered from the "two outcasts" just mentioned, instead of my annual dividend of a dozen apples, from six to eight bushels a piece of as handsome fruit as you ever saw, with about the same proportion from the third, which has always been a moderate bearer."

Pruning. The mode of treating large trees, has been already adverted to in the chapter on pruning. There are some owners of orchards who most erroneously suppose that when trees become old, heavy pruning will restore their vigor in the absence of good cultivation; while the correct mode of treatment, is, very moderate and gradual pruning in connexion with the best of cultivation. The foregoing correct portraits of actually existing specimens of bad pruning, unhappily have too many originals over the country; fig. 102. This

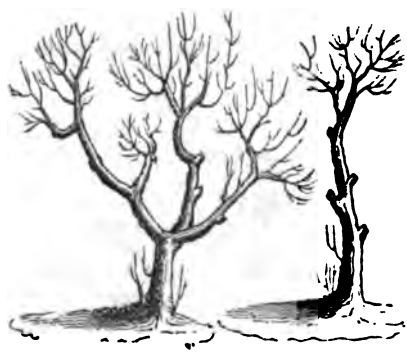


Fig. 102.

most unsightly mode of trimming is often adopted when a removal of the top by grafting is intended.

Grafting new tops on old trees. It often happens that fruit on large trees is worthless, and it becomes an important object to change the top by grafting or budding it with some better variety. In this case, instead of cutting off large branches and grafting them at once, it is better to prune the top in part, as shown by fig. 103, which will cause an emission of vigorous shoots.—These are then budded or grafted with ease and success. And, as the grafts gradually extend by growth, the remainder of the top may, by successive excisions, be entirely removed. Where trees are not too old, and the ground is kept cultivated, good sized trees are thus obtained much sooner than by setting out young ones.

Fig. 103.

To give a well shaped head to such newly formed trees, and to prevent the branches from shooting upwards in a close body near the centre of the tree, the old horizontal boughs should be allowed to extend to a distance in each direction, while the upright ones should be lopped. This is distinctly exhibited in fig 103.

The following judicious mode of renewing the old tops of trees formerly regarded as worthless, is given by George Olmsted, of Hartford, Ct., in the Horticulturist:—

"These trees I commenced grafting six years ago last spring. *I began on the top, and grafted one-third of the tree each year.* It therefore required three years to complete the entire heads of the trees.

"I like this method better than any I have ever tried for grafting large trees, as it gives the grafts a good opportunity to get well started. Cutting off and grafting the top first, gives the grafts there the best possible chance, while the necessary reduction of the top throws the sap into the remaining side branches, which fits them well for grafting the following year; and the third year, the lowest branches being made ready in the same way, may be grafted success-

fully. By this mode, it will be seen that when the grafts are put in on the side branches, they are not shaded by the heavy shoots above them, and they have an unusual supply of nourishment to carrry them forward. Those who have attempted to graft the whole head of a large tree at once, are best aware of the great difficulty in the common mode of getting the grafts to take on the *side limbs*.

"One of these large trees so treated, is probably more than 75 years old, and has now an entirely new and vigorous head, grafted with this excellent variety. When I began with it, the fruit was only fit for cider, and it was questionable whether the tree should not be cut down. By grafting it in this manner, I have added surprisingly to its value. Two years ago, (the bearing year,) I obtained from it 10 bushels of apples; last year eight bushels, and this year, (only six years from the time I began to graft it,) I gathered 28½ bushels of excellent fruit!

"I consider this tree now worth $100; the cost of grafting it was about $5; and the latter was all repaid two years ago—the first season the grafts bore fruit."

The bearing year of apple trees which yield excessive crops, is only every alternate year; but by thinning out a large portion of the fruit while yet small, the exhaustion will not be so great as to render the tree barren the second season, and it will bear annually. By picking off all the young fruit, the bearing year may be entirely changed, or one bough may be made to bear one year, and another bough the second year.

GATHERING AND PRESERVING.

It is of great consequence in gathering all kinds of fine fruit, to avoid bruising; the high quality of some sorts is nearly destroyed by carelessness, and they are rendered unfit for home use or for market. Hence careful hand-picking becomes indispensible.

Preserving in barrels is usually most convenient. They should be filled sufficiently to cause a slight pressure when the barrel head is put in, to prevent rattling; and the barrels should rest on their sides and not on the ends. Winter fruit has been preserved with great success and with much freshness, by alternating the layers of apples in the barrel

with layers of dry chaff mixed with a small portion of dry pulverised lime. Apples may be well kept till spring, if buried late in autumn; but to prevent swelling, cracking, and a loss of flavor, they should be placed in a box or on a bed of straw, and entirely excluded from contact with the damp earth. Where cool cellars are at hand, they are kept best for winter use on large shelves.

The mode of gathering and packing apples for exportation, as practiced by R. L. Pell, of Ulster county, N. Y., who obtains nine or ten dollars per barrel for his Newtown Pippins in the English markets, will serve as a model for the care taken to prevent bruising:—"In autumn, when the apple harvest commences, men are employed, each with a hand basket and hook, to attach the basket to a limb of a tree, and a step ladder. The apples are picked one at a time, and laid into the basket. When the basket is full the man comes down from the tree and takes two apples at at a time and places them in two-bushel baskets. When there are enough large baskets filled for a load, they are lifted by two men on a sled, and drawn by oxen to a large building, where they are taken from the sled and put on the floor, two apples at a time. They are piled up 18 or 20 inches high, where they remain three weeks. At the end of this time, the apples having become dry, they are taken two at a time and packed in new barrels, the size and kind of those used for flour. The barrels being headed up are lifted on a sled and drawn to the North River; they are then carried by men on board a steamboat and taken to New-York. When shipped on board a vessel for London, the barrels are hoisted one at a time from the steamboat, and when lowered on board the vessel are caught on a man's shoulder, and then taken by two men and placed in the coolest part of the vessel.

"Upon the arrival of the vessel in London, the barrels are hoisted from the vessel and lowered on a hand-barrow, and then carried by two men to the warehouse, in the same manner that we carry a looking-glass.

"It is seen that by the foregoing precautions the apples are never *shaken*, *jolted*, or *jarred*, and they arrive in London in far better order than apples usually taken to our city markets.

"Apples for shipping have sometimes been packed in charcoal dust, dry sand,—and at other times separately wrapped in paper, in the same manner as oranges are shipped,—but they can be shipped with as much success without anything with them, if only managed with care in other respects.

"In shipping fruit, none but the very best should be sent; all that are small, imperfect, or the least bruised, should be rejected. Those persons who pay from nine to twenty-one dollars per barrel for apples, expect to have the best.*"

DESTRUCTIVE INSECTS.

The Caterpillar, (Clisiocampa Americana.) This has been a most serious enemy to the apple in most parts of the country. It has its seasons of increase and decrease. Some years it has nearly stripped whole orchards; and again it has diminished in numbers in successive years, till few could be found.

There are many species which feed on the apple leaf; but the only one of importance, is that known as the *common orchard caterpillar*, which is hatched in spring as soon as the leaf buds begin to open. At this time, it is not the tenth of an inch long, nor so large as a cambric needle, but it continues to increase constantly in size for several weeks, until two inches long and a quarter of an inch in diameter. It then spins a cocoon and passes to the pupa state. In the latter part of summer, it comes out a yellowish brown miller, lays its eggs and dies. The eggs are deposited in cylinders or rings, containing three to five hundred each, encircling the smaller branches, and usually within a few inches of the extremity. The accompanying figure (fig. 104,) represents one of these masses of eggs of the natural size. They remain through winter, protected from the weather by a vesicular water-proof varnish, and hatch in spring, as just stated. Each collection of eggs, makes a nest of caterpillars

Fig. 104.

* B. G. Boswell.

One nest is enough to defoliate a large branch, and when several are on a tree, the size and quality of the fruit is seriously lessened.

The best mode for their destruction, is to cut off the small branches which hold the eggs during autumn or winter, and commit them to the fire. The most convenient implement is a long pole, armed with a pair of clipping-shears, worked by a cord; or a sharp hooked knife, on the end of a pole, will answer nearly as well. The eggs are seen at a glance, after a little practice; a cloudy day should be selected to prevent pain to the eyes. If this work is done just at the moment the eggs are hatching, it will be equally efficacious, and the webs or downy covering of the young insects render them conspicuous. Every nest of eggs thus removed, which is done in a few seconds, totally prevents a nest of caterpillars in the spring, and is far more expeditious and effectual than the usual modes of brushing off the caterpillars with poles, brushes, or washing them with soap-suds, ley, or white-wash.

The Borer. (*Saperda bivittata.*) This insect enters the tree and cuts into the solid wood near the surface of the earth. It is a dangerous enemy; for while only a few small holes are perceived in the bark outside, it may have perforated the wood internally in all directions and reduced it to a mass of powder.

It has not yet become very extensively spread, but in some parts of the country it has become a most serious evil, and has been allowed to multiply till it has destroyed whole orchards.

The perfect insect is a brown and white striped beetle, about half an inch long, which flies at night. It deposits its eggs late in spring or the first of summer, in the bark near the surface of the ground, and sometimes in the forks of the branches. The first indication of its presence, is the appearance of numerous small round holes, as if the bark had been perforated by buck-shot. These holes will soon become more visible by the ejected dust.

It is nearly impossible to save a tree, unless taken early. At the first, the insect may be cut out with the point of a knife. If deeper in the wood, it may be extracted by a flexible barbed wire, or punched to death in its hole by

a flexible twig. To prevent the insect from emerging and laying its eggs, it is doubly important that this be done early in the spring; but the trees should be repeatedly examined at other periods of the year.

To prevent the entrance of the borer, remove the soil a little about the roots, and then wash the whole trunk and larger forks of the branches, with a mixture of tobacco water, soft soap, and flour of sulphur. The proportions are, a pint of the sulphur, a gallon of soft soap, and enough tobacco water to reduce the whole to the consistence of paint. This should be done in spring, before the insect lays its eggs. It is stated by A. J. Downing, that this mixture is so offensive to the insect in its winged state, that no tree was touched which had been coated with it;—although the coating had been on for several weeks. He also recommends injecting, by a syringe, this liquid into the holes; and plugging up the holes in spring with pieces of soft pine dipped in tobacco water, to prevent the escape of the perfect insect.

Not only the apple tree, but the quince, mountain ash, and hawthorn, suffer greatly from the attacks of this insect.

The Canker worm. (*Anisopteryx pometaria.*) This caterpillar appears to have been as yet chiefly confined in its destructive ravages, to portions of New-England. The accompanying figures represent the perfect insect, the male with wings, the female nearly destitute. (Fig. 105.) The canker worm attacks both fruit and leaves; when numerous, the small webs they make, added to the destruction of the foliage, give the tree the appearance of having been scorched. The remedies consist in various contrivances to prevent the female insects ascending the tree, but none have been yet discovered of easy, safe, and effectual application. One of the best is to encircle the trunk with a canvass belt, coated with a mixture of tar and train oil. The mixture needs repeatedly renewing. Applying the tar directly to the bark endangers the life of the tree.

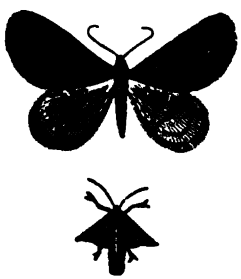


Fig. 105.

The Apple-worm, (*Carpocapsa pomonana*,) attacks the fruit, by entering at the blossom, and feeding at the core. In some

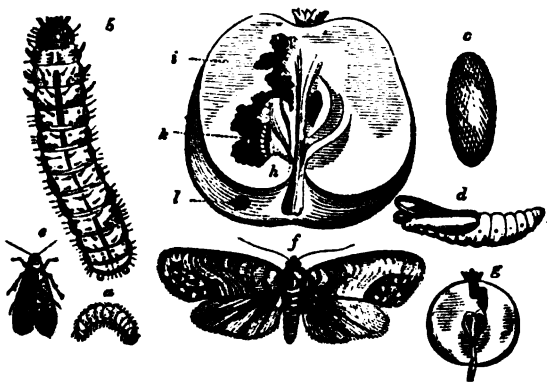


Fig. 106.

years, it has been so common, as seriously to injure the quality of the crop. The best preventive is to allow swine to pick up the wormy fruit as it falls, thus destroying the enclosed insect, and preventing its spread.

The above figures, (106,) exhibit the apple-worm in its different stages; *a*, the larva; *b*, the same magnified; *c*, the cocoon; *d*, the pupa within the cocoon; *e*, *f*, the perfect insects; *g*, the young larva, just hatched, after having been deposited within the calyx; *h*, *i*, *k*, *l*, the progressive work of the larva within the apple, till it escapes.*

The *Wooly Aphis*, (*Aphis lanigera*,) a European insect, falsely termed American blight, is a species of aphis or plant-louse, covered with long, white, cottony hair. In England it has proved very destructive; and on young trees in this country it has done some injury. It is destroyed by whale-oil soap, and by lime-wash. Other species of aphis often infest the young leaves; they are easily killed by a solution of whale-oil soap, which may be applied by a syringe or by immersing the branches.

* The curculio or plum weevil, when very numerous, attacks the apple, and its peculiar crescent-shaped incisions may be perceived on the skin of tender varieties. The larva, however, rarely reaches the core. But the apple worm never attacks the plum, which has no permanent calyx for the lodgment of its eggs.

The Blight, which sometimes kills the terminal shoots of the branches, has been variously ascribed to the sting of an insect, and to the effects of weather. The cause does not appear to have been satisfactorily ascertained. It rarely proves a formidable disaster, although trees are occasionally much disfigured by it, and temporarily checked in growth.

The *Bark-louse* (a species of *Coccus*) which infests the bark of apple and pear trees, may be destroyed by soap-wash or ley, applied early in summer.

THE DEPREDATIONS OF MICE,

May be prevented by a small mound or bank of fresh earth, thrown up to the height of a foot around each tree, late in autumn, to be removed in spring. Trees laid-in or buried in a trench for keeping through winter, are sometimes seriously injured by the attacks of mice. This may be safely guarded against by placing the trees more nearly in an upright position, and banking up a foot high on all sides.

CHANGES WROUGHT BY CLIMATE AND SOIL.

This subject has been treated, as applied to fruits generally in a former part of this work; a few brief remarks on the variations in the apple may be interesting.

The winter apples of the northern states, when cultivated further south, are changed to autumn apples; and as far south as Georgia, some of our good keepers ripen nearly by the end of summer. The Baldwin and Rhode Island Greening at Cincinnati and at St. Louis, cease to be winter fruits. There are few or none of the northern apples which succeed well as keepers as far south as Carolina. This is owing to the long southern summers. It has been found that varieties originated in the southern states are generally best adapted to the climate of that region.

Some varieties are greatly influenced by a change of climate, and others but slightly. The Ribston Pippin, so excellent at Montreal, is of little value a few degrees further south. The Rhode Island Greening and the Roxbury Russet, on suitable soils, throughout New-York and New-England, present the same characteristics of flavor and appearance; the Baldwin, so fine at the east, greatly deteriorates

in northern Ohio; and the Belmont, which has been pronounced the most valuable of all apples at Cleveland, is unworthy of cultivation at Cincinnati. These changes in the latter instances, are however to be ascribed to a difference in soil; and the application of special manures, as lime potash, &c., on those unfavorable soils, has restored their quality. The periods of ripening, given in the following pages, are intended to apply to the northern states. A difference of about two or three weeks exists between fruits cultivated at Boston and Rochester, and in central Ohio and southern Pennsylvania, and other differences of latitude nearly in the same ratio.

VARIETIES.

SYNOPSIS OF ARRANGEMENT.

Division I. Summer Apples.

Class I. *Sweet Apples.*

Section I. Color striped with red.
Section II. Color not striped.

Class II. *With more or less acidity.*

Section I. Color striped with red.
Section II. Color not striped.

Division II. Autumn Apples.

Class I. *Sweet Apples.*

Section I. Color striped with red.
Section II. Color not striped.

Class II. *With more or less acidity.*

Section I. Color striped with red.
Section II. Color not striped.

Division III. Winter Apples.

Class I. *Sweet Apples.*

Section I. Color striped with red.
Section II. Color not striped.

Class II. *With more or less acidity.*

Section I. Color striped with red.
Section II. Color not striped.

The characteristics which constitute these divisions and subdivisions, are not in all cases perfectly distinct. Summer apples gradually pass into autumn, and autumn into winter apples. A few, but the number is extremely small,

possess nearly a neutral flavor between a dead sweetness and slight acidity. Again, apples classed with those that are striped, sometimes present a nearly uniform shade of red; and, in rare instances, the brown cheek of a green or yellow variety exhibits faint stripes.

But these may be regarded rather as exceptions to general characters, which are on the whole as clearly defined as any other distinctive points of the different varieties. Controlling circumstances will produce changes in all fruits, and descriptions are not founded on extreme exceptions, but on *average* characteristics.

The SIZE is designated by comparison;—for example, the Swaar and Baldwin are *large;* Herefordshire Pearmain and Tallman Sweeting are *medium;* English Golden Pippin and Lady Apple are *small.* Qualifying terms give a more precise meaning,—as the Fall Pippin and Monstrous Pippin, are *very large;* Hawley and Dutch Mignonne, are *quite large;* Bullock's Pippin and Early Strawberry are *rather small;* and the Siberian Crab is *very small.*

DIVISION I.—SUMMER APPLES.

CLASS I.—SWEET APPLES.

Section I.—Striped with red.

Red and Green Sweet. Very large, long conical; striped with light red; stalk short, basin narrow, flesh sweet, with a second or third rate flavor. Baking. Late summer.

Section II.—Not striped.

BOUGH. (*Syn.* Large Yellow Bough, Sweet Bough, Early Sweet Bough.) Large, roundish, remotely conical-ovate, sometimes distinctly conical; pale greenish yellow, stalk one-half to an inch long, basin narrow, deep; flesh white, very tender, with an excellent sweet flavor. Ripens from the middle to the end of summer. A moderate and regular bearer. Shoots yellowish, somewhat irregular, ascending; tree round-headed; leaves obtusely crenate.

GOLDEN SWEET. Medium or rather large, roundish, slightly flattened; greenish, becoming pale yellow; stalk an inch or more long, slender; cavity acuminate; basin moderate; flesh very sweet, good, hardly first rate. The fruit is always fair, the tree a free grower, and very productive. Buds large; leaves sharply serrate. Late in summer. Valuable for domestic animals.

Spice Sweeting. Large, roundish, flattened at ends; color whitish green, becoming whitish yellow, with white specks beneath the skin; stalk rather short and thick; basin very smooth and round, wide and distinct, rim quite obtuse flesh rather firm, very sweet, but not wholly pleasant. A good baking apple, but very subject to black spots or scabs. Late summer and early autumn. Cultivated in New-York and New-England. There are several sorts known by this name.

CLASS II.—WITH MORE OR LESS ACIDITY.

Section I.—Striped with red.

AMERICAN SUMMER PEARMAIN. (*Syn.* Early Summer Pearmain, of *Coxe.*) Medium in size, oblong, slightly inclining to truncate-conical; nearly covered with fine broken streaks and dots of red; stalk nearly one inch long; basin round, even, distinct; very tender, often bursts in falling, sub-acid, flavor fine. Continues to ripen for several weeks in late summer and early autumn. Needs good and rich cultivation. Growth rather slow. This is distinct from the English Summer or Autumn Pearmain, in its larger size, higher red, more oblong form, and superior quality.

Benoni. Medium in size, roundish, sometimes obscurely conical; deep red, in distinct broken stripes and dots; stalk half an inch long; basin small; flesh yellow, tender, rich, sub-acid, of good flavor. Late summer. Good bearer. Has not succeeded well in all localities. A native of Dedham, Mass.

Bevan's Favorite. Medium in size, roundish, slightly flattened, obscurely conical; color with broad distinct brilliant red stripes; stalk long, rather stout; cavity

shallow, rather obtuse; calyx large, basin slightly plaited; flesh rather firm, flavor pleasant and sub-acid. Two weeks later than Early Harvest. A native of New Jersey. Succeeds better at Cleveland and in New Jersey than in western New-York.

Borovitsky. Roundish, slightly angular; pale green, translucent, sunny side faintly striped; basin large; flesh white, firm, juicy, sub-acid, agreeable. Late summer. Russian.

Cole. (*Syn.* Scarlet Perfume.) Medium in size, roundish-flattened, sometimes slightly conical; bright crimson in obscure stripes; stalk slender; basin broad; sub-acid, second rate flavor. Late summer. English.

Devonshire Quarrenden. (*Syn.* Red Quarrenden.) Size medium, variable; round-oblate, remotely conical; striped with rich crimson; stalk short, deep set; basin very shallow, plaited; flesh crisp, juicy, sub-acid, pleasant, second rate. Late summer and early autumn. English.

Early Chandler. Medium in size, roundish, slightly flattened, striped light rich red or greenish yellow; stalk half an inch long; basin rather wide, shallow, wrinkled; rather acid, not rich, second rate, flesh very tender, skin thin. Variable in appearance. Middle to end of summer. Growth erect, vigorous. Origin, Conn.; cultivated mostly in Ohio.

Early Joe. Size medium or rather small; oblate, sometimes obscurely approaching conical; smooth and regular; color, with numerous short, broken, red stripes on yellow ground, a nearly uniform deep red to the sun, with conspicuous white specks; stem three-quarters of an inch long, rather thick; cavity shallow, acute; basin small, even; flesh fine grained, very tender, slightly crisp, juicy, sub-acid, spicy, excellent. Ripens the last two weeks of summer. Shoots dark, growth slow. A profuse bearer. Origin, East Bloomfield, N. Y.

Early Red Margaret. (*Syn.* Red Juneating, Striped Juneating, Early Red Juneating.) Rather small, round-ovate, lightly striped with dull red, and somewhat russeted;

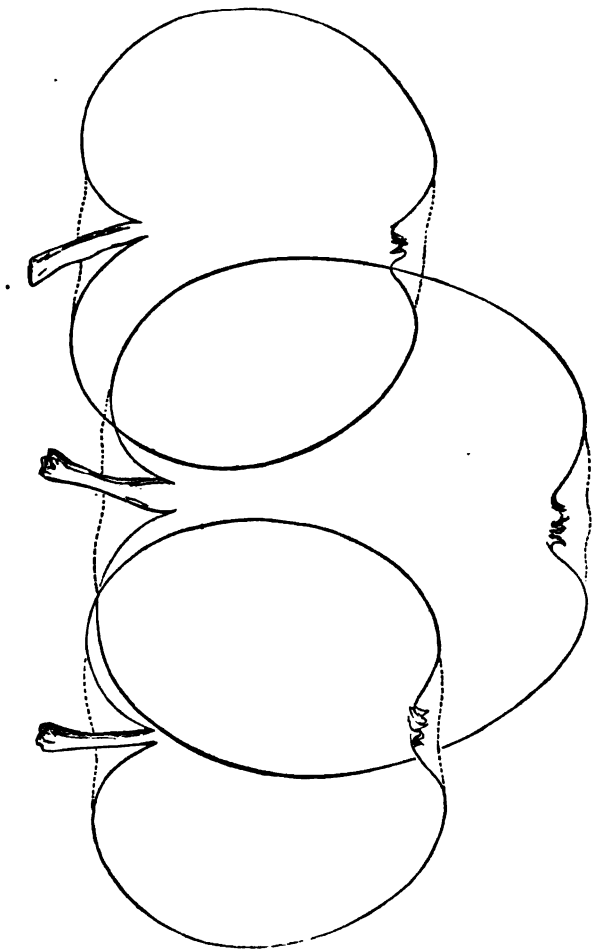


Fig. 107—*Summer Rose.* Fig. 108—*Williams' Favorite.* Fig 109—*Early Joe*

stalk half an inch long, thick; basin plaited, narrow, very shallow; flesh sub-acid, tender, good when fresh. Ripens at wheat harvest, scarcely earlier than Early Harvest. Shoots erect, downy. Moderate bearer.

EARLY STRAWBERRY. (*Syn.* American Red Juneating, of *Manning.*) Rather small, roundish, varying to round-ovate, and sometimes quite conical; surface indistinctly and finely striped with bright and deep red, tinging faintly the flesh; stalk tender, three-quarters to an inch and a half long; basin small and narrow; flesh white, tender, sub-acid, rather brisk, pleasant, not very rich. Ripens one to three weeks later than Yellow Harvest. Growth, very erect; leaves erect, finely crenate. Productive. Good in all localities.

GARDEN ROYAL. Below medium, roundish, slightly flattened at ends, even and regular; surface with small, broken, red stripes on yellow ground, deep red to the sun; stalk short, or half to three-fourths of an inch long, slender, cavity acute; calyx large, open; basin very shallow; flesh yellowish-white, exceedingly tender and fine grained; flavor mild, sub-acid, fine. A poor grower, but a first-rate dessert fruit. Late summer. Origin, Sudbury, Mass.

Irish Peach. Medium in size, roundish, slightly flattened, obtusely ribbed; yellowish green, washed and streaked with brownish-red; stalk short; flesh white; flavor second rate, sometimes third rate

June Apple, of Virginia. Size medium; striped with red; stalk attached to a large protuberance on one side of the cavity; flesh white. Growth vigorous, a profuse bearer alternate years. Ripens in southern Virginia the last of 6th month, (June.)

River. Size medium or large, slightly oblate, ribbed; color yellowish-green in the shade, purplish-red, striped with darker red, next the sun, with some blue bloom; cavity deep; flesh greenish-white, juicy, a little coarse, pleasant, sub-acid, variable in quality, often fine. Tree of vigorous growth, a poor bearer. After Early Harvest. Mass.

Fig. 110.—Early Harvest. Fig. 111.—Skin Qua Non. Fig. 112.—Early Strawberry.

Sops of Wine. Small, roundish-conical, deep crimson, stalk slender, flesh white, stained with pink, firm, crisp, juicy, sub-acid, pleasant. A very pretty, good second-rate fruit. Tree becoming spreading. Late summer and Early Autumn.

Summer Hagloe. Size medium, roundish-oblate; streaked with bright red on yellow ground; stalk rather short and thick; flesh very soft, rich, of fine quality. Ripens at the end of summer—an excellent culinary variety. Shoots dark, strong, thick; terminal buds very large.

This is wholly distinct from the Hagloe Crab, a late, small, ill-shaped, ovate fruit, cultivated only for cider.

Summer Queen. Rather large, roundish-conical, somewhat ribbed; striped with bright red on rich yellow ground; stalk an inch and a half long; cavity small, acute; basin small, furrowed; flesh yellowish, rather acid, spicy, very rich. Fine for cooking. Late summer. Good on warm, sandy soils, poor on cold clay. Shoots light colored, leaves finely crenate.

The Early Pennock, of Ohio, resembles the Summer Queen, but is much larger, and inferior in quality.

Summer Rambour. (*Syn.* Rambour d'Eté, Rambour Franc.) Medium or large oblate, pale greenish yellow, slightly streaked with red; stalk short; calyx large, deep set; slightly sub-acid, good. Middle to late summer. Good bearer. Dry, if over-ripe. Of French origin.

SUMMER ROSE. (*Syn.* Woolman's Early, Woolman's Striped Harvest.) Medium or rather small, roundish-oblate; yellowish, blotched and streaked with red; stalk rather short; basin round, slightly plaited; flesh very tender, slightly crisp, texture fine, mild sub-acid, juicy, excellent. Begins to ripen with wheat harvest, and continues a month. Fine in all localities. Better in quality for the table than Early Harvest, but less productive.

Tetofsky. Size medium; roundish, or round-oblong; handsomely striped red on yellow ground; flesh white, juicy, sub-acid, good second rate. End of summer. Russian.

WILLIAMS' FAVORITE. (*Syn.* Williams, Williams' Red, Williams' Favorite Red.) Size medium, sometimes rather large; oblong-ovate, remotely conical, very smooth; color, mostly fine dark crimson stripes; stalk three-quarters to one inch long, enlarged at insertion, cavity shallow; basin small and shallow, even or somewhat ribbed; flesh yellowish white, moderately juicy, with sometimes a tinge of red near the surface, mild, agreeable, fine. Ripens for several weeks late in summer. Its handsome appearance has partly contributed to its high reputation. Origin, Roxbury, Mass.

Section II.—Not Striped.

Buffington's Early. Medium or rather small; oblate, slightly ribbed; surface smooth yellowish white, with a faint blush; cavity wide, deep; basin shallow, slightly furrowed; flesh very tender and delicate, with a rich, sub-acid, excellent flavor. Two weeks later than Yellow Harvest. Equalled in quality by few summer apples, but a moderate bearer. Origin unknown.

EARLY HARVEST. (*Syn.* Yellow Harvest, Prince's Harvest, Early French Reinette, July Pippin.) Size medium, roundish, usually more or less oblate, smooth; bright straw color, when ripe; stalk rather short and slender; calyx moderately sunk; flesh nearly white, flavor rather acid, fine. Ripens at wheat harvest, and for three weeks afterwards. Shoots erect, slightly diverging, straight, often forked. Very productive. Needs rich cultivation to be fine. Good throughout the northern states.

The Tart Bough is similar, but two weeks later, and inferior in quality; the growth more vigorous and upright.

July Branch, of Virginia. Size medium; bright yellow, very handsome; flesh yellow, flavor sprightly. Bears alternate years, and moderately in the intermediate years. Growth luxuriant. Ripens in southern Virginia at midsummer.

Lyman's Large Summer. Large, roundish, flattened at ends; pale yellow; sub-acid, high flavored, rather fine in

quality. Ripens at the end of summer. Tree a poor bearer till large. Conn.

Mank's Codlin. Size medium; roundish, oblong-ovate; pale yellow, with an orange blush; stalk fleshy; basin shallow, plaited; flesh firm, brisk, sub-acid. Culinary. English.

Oslin. Rather small, roundish-oblate, lemon yellow mingled with some green; stalk short, thick, cavity rather shallow; basin shallow, a little plaited; flesh fine, crisp; flavor spicy, good, hardly first-rate.

Red Astrachan. Rather large, sometimes quite large, roundish-oblate, slightly approaching conical, rather smooth; nearly whole surface brilliant deep crimson, with a thick bloom like a plum; stalk one-half to three-fourths of an inch long; calyx in a small slightly uneven basin; flesh white, rather crisp; good, rather acid, very slightly austere. A few days after Early Harvest. Excellent for cooking. Shoots stout, dark brown, diverging and ascending; leaves broad. This apple, although of second-rate flavor, is rendered by its earliness and very handsome and fair appearance by the vigor and productiveness of the tree, and its excellent culinary qualities, worthy of general cultivation.

Sine Qua Non. Size medium; roundish, inclining to conical; smooth, pale greenish yellow, shaded with reddish brown to the sun; stalk quite slender, nearly an inch long; basin smooth or very slightly plaited; flesh greenish white, fine grained, delicate, very tender, moderately juicy, of a fine, agreeable, sub-acid flavor. Shoots greenish yellow, growth slow; fruit always fair, tree very productive. Ripens two weeks after Early Harvest. Origin, Long Island.

Summer Bellflower. Rather above medium, round-ovate, slightly oblong and conical, yellow, with sometimes a faint orange blush, stalk an inch long, cavity shallow; basin small, smooth, slightly five-sided; flesh white, fine-grained, tender, rich, sub-acid, fine. Shoots vigorous, upright; bears well every year. Origin, Dutchess county, N. Y. New.

Summer Golden Pippin. Small, ovate, flattened at apex; bright yellow, stalk short; flesh firm, crisp, and rich. Last of summer. English.

Sugar Loaf Pippin. Rather large, long ovate-conical, regular, handsome, smooth, pale yellowish white; stalk short, sub-acid, second or third rate. Admired in England; valueless here.

White Astrachan. Medium in size, roundish, slightly conical, ribbed at apex, smooth, nearly white; stalk thick and short; flesh white, pellucid, sub-acid, dry. Of little value here; fine in England. Russian.

White Juneating. (*Syn.* Bracken, of Ohio.) Small, round, sometimes slightly oblate, smooth, very regular; pale greenish yellow, or light yellow; very thin russet round the stalk; stalk slender, three-quarters of an inch long, set shallow; basin very shallow; tender, sub-acid, not rich, becoming dry, second or third rate flavor. Ripens a little before Yellow Harvest. Growth upright, rather stout. Productive. For cooking only.

The *May apple*, of Virginia, is a fruit similar in character and quality to the White Juneating, where it ripens about the first of summer, bearing every year. Large quantities are sent to Baltimore for tarts.

DIVISION II.—AUTUMN APPLES

CLASS I.—SWEET APPLES.

Section I.—Striped with red.

Beauty of the West. Large, round, smooth, marked with small stripes of red on greenish yellow; stalk short; sweet, second rate.

Blenheim Pippin. (*Syn.* Woodstock Pippin, Bleinhim Orange.) Large, roundish-conical; mottled and striped orange-red on yellow ground; stalk short; sweet, second or third rate flavor. Used for baking. English.

Graniwinkle. Size, medium; roundish, slightly oblong, dark red, somewhat rough, flesh yellowish orange, sweet, rich. Cider. N. Jersey. Late autumn and early winter.

Jersey Sweeting. Size, medium; round-ovate, often oblong-ovate, somewhat conical; thickly striped with fine red on greenish yellow; stalk one-half to an inch long; cavity rather irregular; basin wrinkled, distinct; flesh whitish, very sweet, juicy and tender, good second rate or nearly first rate in flavor. Good in all localities. Early and mid-autumn—immediately follows Golden Sweet. Shoots stout, short jointed; leaves crenate-serrate.

Peach-Pond Sweet. Size, medium; roundish-oblate, remotely conical; delicately striped light red on pale greenish yellow; stalk slender, varying in length from half an inch to an inch; tender, rich, sweet. Nearly or quite first rate. Mid-autumn. Origin, Dutchess County, New-York.

Section II.—Not striped.

Autumnal Swaar. (*Syn.* Sweet Swaar.) Large, oblate, sometimes very slightly ribbed; rich yellow; stalk an inch or more long, varying from long and slender, to thick and fleshy at insertion; cavity and basin wide and slightly ribbed; flesh tender, yellowish, not juicy, with a very sweet, spicy, agreeable flavor. Mid-autumn. Growth vigorous, shoots diverging, tree spreading. One of the finest autumn sweet apples.

Haskell Sweet. Large, oblate, regular, greenish, a warm brown cheek; stalk one-half to three-fourths of an inch long, moderately sunk; basin rather deep, nearly even, flesh tinged with yellowish brown, very tender, sweet, good. R. Manning says this is the best of autumn sweet apples.

Lyman's Pumpkin Sweet. Very large, roundish, ribbed most towards the stalk; pale green; stalk short; calyx small, basin abrupt; flesh white, sweet, tender, not juicy; second or third rate. Ripens through autumn. Good for baking.

Pumpkin Russet. (*Syn.* Sweet Russet.) Large, round, slightly flattened, yellowish green, partly russeted; cavity wide, shallow; basin small; flavor rich and sweet. Through autumn. Distinct from the Sweet Russet cultivated through western New-York, which is a more conical fruit.

Summer Sweet Paradise. Large, roundish, sometimes remotely oblong, and slightly flattened at the ends, regular, pale green; stalk rather thick, three-quarters of an inch long; basin large, distinct; flesh, tender, sweet, rich, aromatic, of first rate flavor. Ripens first of autumn. Shoots spreading, leaves sharply serrate. Origin, Penn. This is totally distinct from the Dwarf Paradise, used for stocks, which bears a small, third rate, sweet, summer fruit.

Tifft Sweeting. Medium in size, flat, greenish yellow, with russet network, and a warm, light brown cheek; stalk one inch long, cavity wide, obtuse; flesh yellowish, rich, sweet, fine in flavor. First rate, but a light bearer. New England.

Class II.—With more or less Acidity.

Section I.—Striped with red.

Alexander. Very large, conical, flattened at base, regular; streaked with bright red on greenish yellow; stalk small, cavity rather deep; calyx large, basin deep, even; flesh rather crisp, sub-acid, second or third rate in flavor. A moderate bearer. Late autumn. Very showy, its only recommendation. Russian.

Beauty of Kent. Very large, roundish, somewhat flattish-conical, fair, smooth, and rather obtuse; nearly the whole surface striped with rich purplish red; stalk three-fourths to an inch and a half long, slender, cavity acuminate; calyx small, basin deep, narrow; flesh tender, slightly sub-acid, third rate in flavor. One of the most beautiful and magnificent in appearance of all apples. Late

autumn. Growth strong and upright, shoots dark. English.

Cooper. Rather large, round-oblate, sides unequal, greenish yellow and pale red; stalk slender, deep set; basin deep; flesh crisp, juicy, pleasant, but not very high flavor. Mid-autumn. Cultivated in central Ohio.

Cornish Aromatic. Medium in size, roundish, angular; rich red on a pale russet ground; stalk short, cavity deep; calyx small, basin narrow; flesh yellow, sub-acid, aromatic; quality fine, but the fruit not fair. Late autumn. English.

Doctor. (*Syn.* De Witt.) Medium in size, or large; regular, oblate; yellow, clouded and streaked with red; stalk and calyx deep set; flesh breaking, tender, aromatic, brisk, fine flavor. Late autumn and early winter. Succeeds well in Pennsylvania and Ohio; less esteemed further north. Origin, Pennsylvania.

Dutchess of Oldenburgh. Medium or rather large, roundish, a little flattened at the ends; light red in broad broken stripes and splashes on yellow ground; stem short, in an acuminate cavity; basin deep and narrow; flesh yellowish white, sub-acid, second rate, very handsome. Good for cooking. Early autumn. Shoots dark, ascending.

English Summer Pearmain. (*Syn.* Autumn Pearmain, Summer Pearmain.) Size, medium; roundish, slightly oblong-conical; streaked and shaded with light dull red; stalk short; basin broad, shallow, slightly plaited; moderately juicy, rich, high flavored. Growth slender, slow, becoming somewhat irregular. Early autumn. Distinct from the American Summer Pearmain, and from the Winter Pearmain. With the latter, this has been confounded, the name *Autumn Pearmain* having been applied to both.

Fameuse. (*Syn.* Pomme de Neige.) Medium in size, round, often oblate, even; handsomely striped and blotched with fine deep red on whitish ground,—where much exposed, a deep, nearly uniform red; stalk three-fourths of an inch long, slender, cavity small; basin

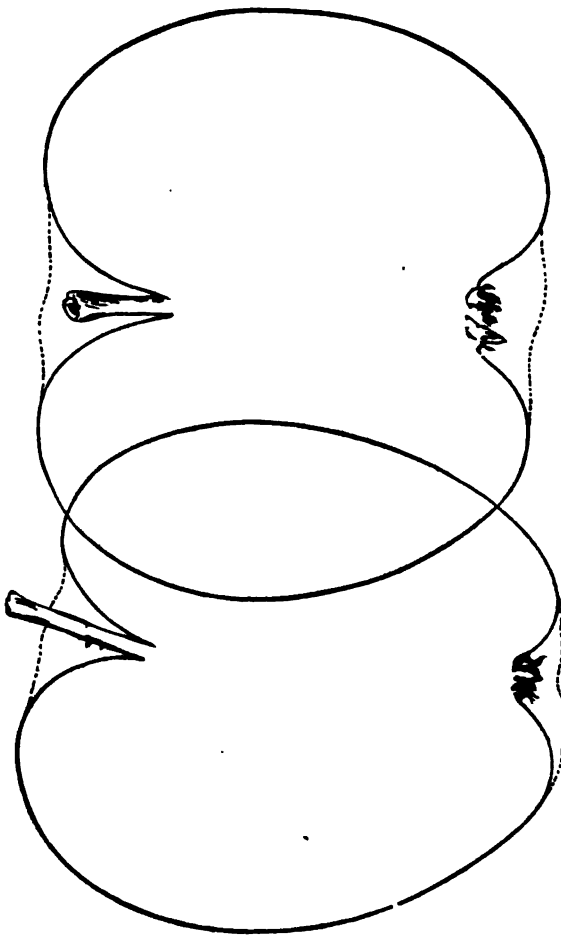


Fig. 114.—*Gravenstein.*

Fig. 113.—*Porter.*

quite small, slightly wrinkled; flesh very white,* juicy, sub-acid, a little spicy, pleasant, but not very rich. Late autumn. Shoots dark, diverging, somewhat flexuous.

Gloucester Cheese. Large; bright red, with some indistinct stripes; flesh white, crisp, flavor high. Growth strong. A native of Virginia, where it is one of the best early autumn apples, beginning to ripen by the end of summer.

GRAVENSTEIN. Rather large, roundish, slightly oblate, obtusely and obscurely ribbed, surface a little wavy; striped and splashed with bright red on a yellow ground; stalk three quarters of an inch long, cavity rather deep; calyx large; basin deep, narrow; flesh tender, juicy, very rich, sub-acid or rather acid, high flavored. Mid-autumn. Productive, handsome, and excellent. Fine in all localities. Shoots strong, becoming smooth, and shining, ascending. German.

Hunter. Size, medium; roundish-oblate, slightly conical; striped with various shades of red, sometimes slightly russeted, with minute prominences under a smooth skin; stalk three-fourths of an inch long, slender, cavity narrow, deep; calyx small, basin rather deep; flesh white, with sometimes faint pink streaks, crisp, tender, juicy, flavor excellent. Mid-autumn. Origin, Newtown, Delaware Co., Pa. New.

Jeffries. Medium or rather large; round-oblate; yellow, red, and deep red, striped; stalk very short, slender; cavity and basin, deep; flesh yellowish white, remarkably tender and juicy; flavor very pleasant. Ripens first of autumn. Origin, West-Chester, Pa. New.

Jewett's Red. (*Syn.* Jewett's Fine Red.) Medium or rather large, roundish, slightly oblate, striped red on yellow or slightly greenish yellow ground, with conspicuous white dots; stem nearly an inch long, cavity acuminate; basin rather shallow; flesh remarkably tender, fine grained, mild sub-acid, slightly aromatic; nearly first rate. Mid-autumn. Cultivated in the northern parts of New England.

* Whence the name *Pomme de Neige*, or "Snow Apple."

Kane. (*Syn.* Cane, Cain.) Size, medium; roundish-oblate, often obscurely conical, regular; surface fair and beautiful, highly polished, indistinctly striped with brilliant light crimson, gradually merging into delicate blush color on the shaded part; stalk often very short, cavity acute, narrow; basin regular; flesh yellowish white, with a pleasant, good flavor. Hardly of the highest quality, but much admired for its beauty. A native of Kent Co., Delaware.

Kenrick's Autumn. Large, roundish, flattened at base; bright red on a pale yellowish green ground; stalk long; flesh a little stained with red, sprightly, sub-acid, second or third rate. Early autumn.

Kerry Pippin. Medium in size, oval, yellow streaked with red; stalk with a projection on one side at the insertion; flesh yellow, tender, crisp. A third rate fruit. Irish.

Kilham Hill. Rather large, roundish, slightly conical, somewhat ribbed; striped with red on light yellow, stripes often obscure; flavor good at first, but becomes dry and worthless. Early autumn. Fair and productive. Essex county, Mass.

King of the Pippins. Medium size, roundish-oblate, obscurely conical; striped rich yellowish red; stalk one inch long, cavity shallow; calyx large, basin deep, even; flesh, firm, sub-acid, second rate in flavor. Growth upright; tree productive. Late autumn. Admired in England, unsuccessful here.

Late Strawberry. (*Syn.* Strawberry, Autumn Strawberry.) Size medium; roundish, slightly conical, sometimes faintly ribbed; nearly whole surface with small broken streaks of light and dark red; stalk slender, about an inch long; basin ribbed; flesh yellowish white, slightly fibrous, very tender and juicy, with a fine, very agreeable, sub-acid flavor. Young trees of remarkable thrifty growth, leaves sharply serrate, which at once distinguishes them from the crenate leaves of the Early Strawberry. Ripens early in autumn, and often keeps till winter. Very productive. One of the best early autumn apples.

LELAND SPICE. (*Syn.* Leland Pippin.) Large, roundish, obscurely conical, slightly ribbed; whole surface with brilliant red streaks on yellow ground, dotted with yellow; stalk half an inch long; cavity and basin ribbed; flesh yellowish white, sub-acid, spicy, rich, fine. Origin, Sherburne, Mass.

Lyscom. Large, round, with broad, broken, distinct, pale red stripes, on yellowish or greenish yellow ground; stalk three-fourths of an inch long, slender; calyx deep set; flesh fine grained, mild, slightly sub-acid, moderately rich, good second-rate flavor. Middle and late autumn. Mass.

MELON. (*Syn.* Watermelon, Norton's Melon.) Medium or large, roundish, often slightly conical, frequently a little irregular; color, with stripes and dots of bright red on yellow ground, or clear red on pale yellow; stalk an inch long, slender, cavity acuminate; basin deep; flesh white, tender, very juicy, fresh, and pleasant, spicy, sub-acid, or slightly sub-acid, fine-flavored. Growth rather slow. Late autumn and early winter. Origin, East Bloomfield, N. Y

Nonsuch (English.) (*Syn.* Nonsuch.) Size medium; regular, oblate; striped with dull brick red, on greenish yellow ground; stalk short, slender; basin wide, shallow; flesh white, soft, sub-acid, second rate. Wholly unlike the Old Nonsuch of New-England, or Red Canada.

RAMBO. (*Syn.* Romanite of N. J.) Size medium; oblate, smooth, streaked and marbled with dull yellowish red, on pale yellowish ground; dots large; whitish; stalk an inch long, rather slender; basin broad, slightly plaited; flesh tender, rich, mild sub-acid, fine flavored, often excellent. Fine in nearly all localities. Late autumn and early winter. Known by the erroneous name of Seek-no-further in Philadelphia market.

Red Ingestrie. Rather small, oblong or ovate; mottled with red: stalk short, slender; basin wide; flesh firm, juicy, rather high flavored. Admired in England; unworthy of cultivation here. Early and mid-autumn.

Republican Pippin. Large, round-oblate, striped with red on a mottled reddish ground, greenish yellow in the shade;

stalk an inch long, slender; cavity sometimes with radiating russet rays; flesh tender, sub-acid; with a pleasant, first-rate, peculiar, somewhat walnut flavor. Ripens early and mid-autumn; but is a good cooking apple in summer. Excellent for drying. Origin, Lycoming county, Pa. New.

Ribston Pippin. Medium or rather large, roundish-conical; clouded and striped with yellowish red, on a yellow and slightly russeted ground; stalk slender, often short, cavity rather wide; basin narrow, angular; flesh yellow, crisp, granular, juicy, with a very rich and rather sharp or acid flavor. First-rate as far north as Maine, often second-rate further south; but its quality is usually suffered to deteriorate needlessly by remaining too long on the tree. Late autumn and early winter. Shoots diverging or spreading; buds and young shoots rather hoary. English.

Ross Nonpareil. Medium or small, roundish, obscurely conical; color thin russet and dull red, blotched, and obscurely striped; stalk slender, cavity rather acuminate; basin small; flesh greenish white, with a rich aromatic or fennel flavor. Late autumn. Very productive. Irish.

Scarlet Pearmain. Medium size, conical, rich crimson; stalk slender, deep set; calyx open or spreading, basin deep, slightly plaited; flesh white, tinged with pink, crisp, juicy, good. Early autumn. Productive. English.

Smokehouse. Medium or rather large, oblate, regular; mottled and indistinctly striped with red on yellow ground; a slight greenish cast at the crown; stalk one inch long, slender, cavity wide, acute; basin rather distinct; flesh yellowish white, rich, aromatic, fine sub-acid flavor. Nearly or quite as good as Rambo, which it somewhat resembles. Origin, Chester Co., Pa.

St. Lawrence. (*Syn.* Corse's St. Lawrence.) Large roundish, slightly oblate, and sometimes a little conical, obtuse; whole surface broadly and very distinctly striped with very dark red, on light greenish yellow ground; stem rather short and slender, cavity wide; basin round, deep, with

a very obtuse rim; flavor rather acid, moderately rich, agreeable. A very handsome and productive apple, of good second-rate flavor, ripening about mid-autumn. Canadian.

Twenty Ounce. (*Syn.* Eighteen Ounce, Twenty Ounce Pippin, erroneously.) Very large, roundish, remotely conical, surface sometimes smooth, often very wavy; color striped rich yellowish red on greenish yellow, or yellowish white ground; stalk three-fourths inch long; sub-acid, rather coarse, second-rate. Very showy, fair and productive. Culinary only. Late autumn and early winter. Growth in large trees becoming straggling. Western New-York. The Twenty Ounce Pippin is a large, green, third-rate fruit.

Section II.—Not striped.

Downton Pippin. Small. round-oblate, yellow; stalk short; calyx in a wide, very shallow basin; flesh crisp, rich, acid. Latter half of autumn. English.

Drap d'Or, or "Cloth of Gold." Large, roundish, sometimes slightly oblong-conical, more frequently rather oblate; bright yellow with numerous black specks; stalk short; basin shallow, plaited; flavor sub-acid, mild, agreeable. Early autumn, extending to mid-autumn. Growth of the tree round, regular, and spreading; leaves doubly serrate.

Dutch Codlin. Very large, roundish, approaching oblong, irregular, strongly ribbed; pale yellow, tinged with orange in the sun; stalk short, thick; basin narrow, ribbed; flesh white, sub-acid, second or third rate. Early autumn. Growth vigorous. For cooking only.

Dyer. (*Syn.* Pomme Royal, which is the original name.) Rather large, roundish, often approaching round oblong, sometimes slightly flattened, obscurely ribbed; light yellow, rarely a faint brown cheek, and sometimes a slight russet network over the skin; stalk three-fourths to one inch long; basin often deep and large, ribbed; flesh very fine grained, tender, very juicy, with a rich sub-acid or rather acid, excellent flavor, having but few equals. Time

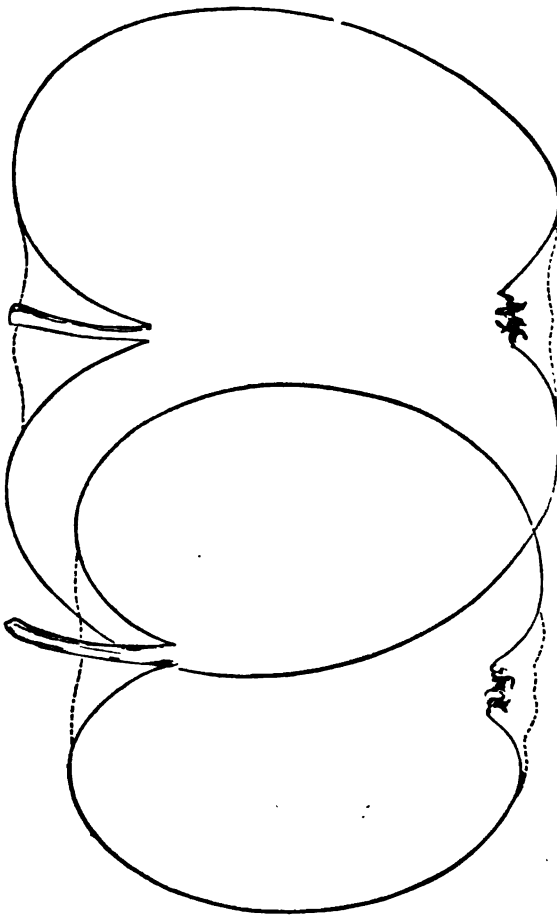


Fig. 115—*Hawley.*

Fig. 115—*Dyer.*

of ripening, variable, from early autumn to winter. Productiveness, variable.

English Codlin. Rather large, oblong or conical, yellow, stalk short, pleasant, sub-acid, second rate. Culinary. Tree vigorous and productive. Early and mid-autumn.

Esten. Large, oblong-ovate, slightly ribbed, smooth; yellow, sometimes a blush; dots large, green and red; stalk one inch long, slender; cavity very deep; basin shallow; flesh white, fine grained, mild sub-acid. Tree vigorous, very productive. Rhode Island. New.

Fall Cheese. Size, medium; color, green with a red cheek; flesh crisp, sprightly, very agreeable. Tree of compact growth, a profuse bearer. Its cultivation is chiefly confined to Virginia, and is one of the best apples of that State, ripening the latter half of autumn.

Fall Harvey. Large, roundish oblate, nearly regular; pale yellow; stalk slender, one inch long, cavity moderate; basin medium in size, furrowed; flesh fine grained, juicy, good, rich sub-acid flavor, but hardly first rate, often second rate. Moderate or poor bearer. Essex Co., Mass.

Fall Orange. Large, roundish ovate, or oval; light greenish yellow becoming pale yellow; rarely a brown cheek; stalk half an inch long, cavity narrow; basin even-rimmed, slightly plaited; sub-acid, tender, fine—first rate if well ripened and fresh from the tree. Shoots very stout, dark colored. Tree bears while very young, fruit always fair.

FALL PIPPIN. (*Syn.* Holland Pippin, erroneously.) Very large, roundish, obtuse, somewhat oblong-conical, a little flattened at the ends, sometimes with large obtuse ribs; color greenish, becoming a high rich yellow when ripe, with some large shades of green about the crown before fully ripe; stalk large, in an acuminate cavity; basin deep; flesh yellowish, rather firm, becoming tender, rich, aromatic, excellent. Leaves sharply serrate; shoots vigorous, rather dark, diverging, becoming spreading; tree large. Late autumn, keeping into mid-winter.

Mostly a moderate bearer—fruit sometimes water-cored. Excellent for cooking. Fine in nearly all localities.

Franklin's Golden Pippin. Medium in size, oval or ovate; deep yellow, specks dark, numerous; stalk short, slender; flesh tender, crisp, rich, aromatic. Growth vigorous, upright. Ripens mid-autumn.

Grand Sachem. Large, roundish, ribbed, irregular; dark dull or dingy red; stalk short, stout; basin distinct; flesh white, rather dry, flavor poor. Early autumn.

Hawley. (*Syn.* Dowse.) Quite large, roundish, slightly conical, sometimes nearly round, with a broad obtuse apex, and slightly flattened; smooth, slightly oily when kept within doors; pale green becoming yellow, sometimes a very faint orange cheek; stalk one-half to one inch long, slender; cavity wide, deep, acute, sometimes slightly obtuse; basin deep, slightly furrowed; flesh yellowish white, fine-grained, quite tender, with a mild, rich, sub-acid, fine flavor. Ripens at mid-autumn. A very valuable apple. Shoots of rather slow growth. Origin, Columbia Co., N. Y., and cultivated chiefly in western N. Y.

Hawthornden. (*Syn.* White Hawthornden.) Rather large, roundish, oblate-conical; whitish yellow, a blush on the sunny side; stalk rather stout; calyx in a regular, plaited basin; flesh juicy, sub-acid, pleasant, not rich. Fair, productive; for cooking only. Tree spreading.

Holland Pippin. Very large, roundish, somewhat oblong, and flattened at the ends, sometimes slightly oblate; greenish yellow, becoming pale yellow or whitish yellow, with a brownish red cheek; stalk variable in length, usually short, cavity wide, acute; basin slightly plaited; flesh nearly white, rather acid, with a second rate flavor. Ripens early and mid-autumn, but is a good cooking apple some weeks previously. Wholly distinct from the Fall Pippin.

Keswick Codlin. Rather large, somewhat conical, obscurely ribbed; greenish yellow, becoming light yellow; stalk short, deep set; calyx rather large; juicy, pleasant acid, second-rate. Cooking. Productive. English.

Lemon Pippin. Medium size, oval, regular; pale green, becoming yellow; stalk short, fleshy, curved inwards, surrounded by a fleshy protuberance; basin small, even; flesh firm, brisk, pleasant sub-acid. Late autumn and early winter. Tree erect.

Lowell. (*Syn.* Orange, Tallow apple, Tallow Pippin, Queen Anne, of northern Ohio.) Large, roundish-oblong, obtuse, slightly conical; green becoming rich yellow; surface slightly oily; stalk one inch long, basin deep, furrowed or plaited inside, rim obtuse, even; flesh yellowish white, rather coarse, rich sub-acid, or rather acid, hardly first-rate, but valuable for its fair surface and great and early productiveness. Early autumn.

Maiden's Blush. Rather large, oblate, smooth and regular, with a fine, evenly shaded red cheek or blush on a clear pale yellow ground; stalk short; cavity rather wide; basin moderate, even; flesh white, fine-grained, tender, pleasant sub-acid, but not rich, good second-rate. Mid-autumn. Tree spreading. Although deficient in richness, it is admired for its fair, tender, and beautiful fruit, and uniform productiveness.

Menagére. Very large, quite oblate, regular, pale yellow, sometimes a faint blush, stalk short, flavor poor. Middle and late autumn. Culinary only. German.

Orne's Early. Rather large, somewhat ribbed, pale yellow, sprinkled with thin russet, and with a dull red cheek towards the sun. Flesh white, very tender, juicy, and with an exceedingly pleasant and fine flavor. Ripens the first of autumn. This apple was imported from France into Marblehead, Mass., and the name being lost, it received that of the importer, in the same way that the Williams Bonchretien pear was changed to Bartlett.

Porter. Rather large, oblong-ovate-conical, regular, often ribbed at apex; bright yellow, sometimes a dull blush in the sun; stalk one inch long, slender, cavity rather small; basin narrow; flesh tender, rich sub-acid, of fine flavor. Fair and productive. Early autumn. Good throughout the northern states. Leaves sharp serrate.

Quince. Large, oblate; rich lemon yellow when ripe; rich, juicy. A great bearer alternate years. Late autumn.

Red Ashmore. Medium or rather large, nearly round, smooth and glossy, rich crimson shaded into pale red and pale yellowish white; juicy, delicate, pleasant. Very beautiful. Late autumn. Little known. The Striped Ashmore is a distinct variety.

Siberian Crab. This is the *Pyrus baccata* of botanists, a distinct species from all our common apples, which are varieties of the *Pyrus malus.* The *common Red Siberian Crab* is very small, about an inch in diameter, nearly round, with a brilliant scarlet cheek, on a pale clear, waxen yellow ground, stalk very long and slender; tree very productive, and bears when very young. Too hard for preserving, but makes excellent jelly. The *Large Red Siberian Crab*, (*P. prunifolia,*) is about twice the size of the preceding, round-ovate, calyx prominent, skin pale red and yellow. Some seedlings also from the common Red have been triple the size of the original. The *Yellow Siberian Crab* is larger than the common, of a fine rich yellow.

Stroat. Rather large, roundish, regular, very slightly conical; pale yellowish green; specks small, clear; stalk three-fourths of an inch long, in a rather obtuse cavity; basin small, slightly furrowed; flesh tender, rich, mild, sub-acid, flavor fine. Late autumn. Not good in some localities. The name is from the Dutch, *stroot,** a street, the place of its origin.

Surprise. Medium or rather small, roundish, skin yellow, flesh red. Quality worthless; sometimes cultivated for its singular red flesh within the yellow skin.

Tompkins Apple. Large, roundish-oblong, rather angular, slightly ribbed near the apex, smooth; color rich yellow; stalk short, small, cavity narrow; calyx small, basin deep, plaited; flesh tender, rich, sub-acid. Last half of autumn. Origin, Tompkins Co., N. Y. New.

* Pronounced *strote.*

Wormsley Pippin. Size medium, roundish, slightly conical; pale greenish yellow; stalk rather long, calyx deep sunk; flesh white, firm, crisp, high-flavored, but too acid. English.

Yellow Ingestrie. Small, clear rich yellow, tender, delicate, juicy when fresh, crisp, spicy. English. Of little value in this country.

DIVISION III.—WINTER APPLES.

Class I.—Sweet Apples.

Section I.—Striped with red.

Bailey Sweet. (*Syn.* Patterson Sweet, Edgerly Sweet.) Large, regular ovate, often slightly and sometimes considerably ribbed; the whole surface frequently a full bright red, in small, broken, indistinct stripes and dots, on light ground; stalk slender, one inch long; cavity small, narrow, slightly ribbed; basin small, plaited; flesh very tender, not juicy; a pure, mild, rich sweet; fine. Early winter. Origin, Perry, Wyoming Co., N. Y. New.

Hartford Sweeting. (*Syn.* Spencer Sweeting.) Rather large, roundish, slightly flattened; striped with fine red on greenish yellow ground; stalk slender, cavity rather shallow, round; calyx large, basin shallow; juicy, tender, rich, agreeable. Keeps through winter and spring. Productive. Growth slow, shoots becoming drooping. Although hardly first-rate in quality, valuable for its great productiveness and long keeping. A native of Hartford, Connecticut.

Ladies' Sweeting. Rather large, roundish-ovate, apex narrow; striped with red on pale yellowish green ground, a nearly uniform shade of fine red to the sun; faintly marbled or clouded with white over the red; and cavity faintly rayed with white; stalk short, cavity small; calyx and basin small; tender, juicy, agreeable, fine, rich.

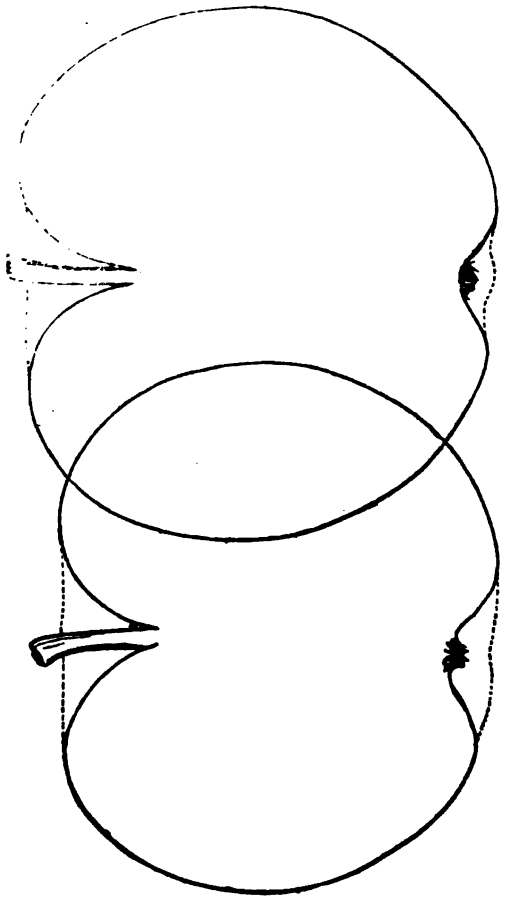


Fig. 117—*Baldwin*

Fig. 118—*Ladies' Sweeting.*

Through winter and into spring. A profuse bearer. Growth not vigorous. Newburgh, N. Y.

Phillips' Sweeting. Medium or large, roundish, slightly flattened and conical, regular; mottled red, yellow, and dark red; flesh rich yellow, tender, juicy, crisp, sweet. Very handsome; resembles Ladies' Sweeting, but more showy and not equal in flavor. Early winter; Growth upright, vigorous. Central Ohio.

Ramsdell's Sweeting. (*Syn.* Ramsdell's Red Pumpkin Sweet.) Rather large, oblong, obscurely conical, regular; dark rich red, with a blue bloom; stalk short; basin rather deep, even; flesh yellowish, tender, sweet, rich, good second-rate, or nearly first-rate. Tree vigorous, upright, very productive. Late autumn and early winter. Conn.

Sweet Baldwin. Medium or rather large, round, often round-oblate, very obscurely conical, very regular; color a fine deep red indistinctly striped on yellow ground; stalk three-quarters of an inch long, slender, cavity very even; basin rather small, nearly smooth; flavor, very sweet, nearly first-rate. Early winter.

Sweet Pearmain. (*Syn.* English Sweeting, of Rhode Island.) Medium size, roundish or ovate-conical; dark rich red, with rough dots; stalk an inch long, slender, cavity wide, round; calyx wooly, basin very small; flavor sweet and rich. Early winter. Introduced from England before the revolution.

Section II.—Not striped.

Broadwell. Rather large, slightly conical, somewhat oblate; skin thin, smooth, greenish yellow; stalk short, small, deep set; flesh white, tender, sweet, juicy, fine—often first rate, and one of the best winter sweet apples. Keeps through winter late into spring. Ohio. New.

Cann. Size, medium; conical; green with a brownish shade near the stalk; very sweet. Early winter. N. J.

Danvers Winter Sweet. Medium or rather large, roundish, remotely oblong or conical, obscurely ribbed;

greenish yellow, becoming a rather dull rich yellow,—sometimes an orange blush; stalk three-quarters to one inch long, cavity acute; basin smooth, narrow; flesh yellow, sweet, rich. Growth vigorous, tree productive.

Green Sweet. Large or medium; nearly round, slightly approaching ovate-conical, regular; surface green, with greenish white dots; stalk about an inch long, moderately thick, cavity rather small and narrow, round acuminate; basin, small, slightly furrowed; flesh greenish white, with a very sweet, spicy, good flavor. Fair, productive, and a long keeper.

Old-Town Crab. (*Syn.* Spice apple of Va.) Rather small; greenish yellow, with brown specks; flesh crisp, sweet, fragrant, juicy, sprightly. Growth strong, trees compact. Cultivated in southern Virginia; keeps there through winter into spring.

Sweet Russet. Large, ovate-conical, largest at middle, tapering slightly to base, and much narrowed to apex; green becoming yellow, with patches of russet; stalk one-half to one inch long, cavity narrow; basin narrow, uneven; flesh tender, rather spongy, with a good and quite sweet flavor. Fair and productive. Considerably cultivated in western New York and elsewhere. Early winter.

Tallman Sweeting. (*Syn.* Tolman's Sweeting.) Medium or rather large, roundish oblate, slightly conical; clear light yellow, with a clear brownish line from stalk to apex; stalk nearly an inch long; calyx in a distinct, slightly wrinkled basin; flesh white, firm, rich, very sweet. Excellent for winter baking. Keeps into spring. Young tree vigorous, upright, shoots becoming spreading; leaves wavy. Productive.

Wells' Sweeting. Medium in size, roundish, tapering slightly to base and apex; color light green, with a brownish cheek; stalk short; basin shallow; flesh very white, tender, rich, agreeable. Early winter. Newburgh, N. Y.

Victuals and Drink. Large, roundish, often oblong-conical, more or less irregular; dull yellow, slightly russeted; stalk rather slender; basin shallow, slightly ribbed; flesh fine grained, breaking, rich, sweet, light. Ripens late autumn and early winter. A moderate bearer. Newark, New Jersey.

Class II.—With more or less Acidity.

Section I.—Striped with red.

American Pippin. (*Syn.* Grindstone.) Medium size, oblate, regular; light dull red on dull green; dots whitish, conspicuous; rather rough; stalk short, often quite fleshy; basin very shallow; flesh very hard; mild sub-acid. Long keeping, but poor. Shoots crooked, irregular.

BALDWIN. Rather large, roundish, with more or less of a rounded taper towards the apex; shaded and striped with yellowish red and crimson on yellow ground; stalk three-quarters of an inch long, rather slender; calyx in a narrow, slightly plaited basin; flesh yellowish white, with a rich, mild, sub-acid flavor. Young tree vigorous, upright, shoots dark brown, diverging and ascending. Very productive. Ripens through winter. A first rate winter apple through New-England and New-York; unsuccessful in northern Ohio. The use of special manures, as lime, potash, and salt has, however, on those unfavorable localities, been attended with the best results, and produced fine fruit; showing the deficiency to be in the soil.

The Baldwin is liable to vary in character; the Late Baldwin of Maine, appears to be identical, but modified by external causes.

Black Apple, of Coxe. Rather small, roundish, slightly oblate; dark red, nearly black, with a whitish, mealy bloom; stalk half to three-fourths of an inch long; basin rather shallow; flesh yellowish red, crisp, juicy, second rate in quality. Early winter. Old tree becoming rather drooping.

Black Detroit. (*Syn.* Red Detroit.) Rather large, roundish, slightly oblate, apex ribbed; dark or blackish red or purple; basin plaited; flesh white, often stained red, mild sub-acid, not high flavored. Early winter.

The Black Coal and Black Apple, of Ohio, closely resemble the Black Detroit in quality, and are perhaps identical.

Black Gilliflower. Rather large, oblong-ovate, long conical, regular, obscurely ribbed; surface dark, dull, reddish purple, inclining to greenish yellow where densely shaded; cavity very narrow, acuminate; basin very small, ribbed; flesh greenish white, with a rich, good slightly sub-acid flavor, becoming dry when ripe. Keeps through winter and late into spring. Shoots dark, rather crooked, fruit always fair; very productive. Rejected by most cultivators on account of its very dry flesh. Totally distinct from the Red Gilliflower.

Blue Pearmain. Very large, roundish, inclining to oblong, slightly and obtusely conical; dark purplish red in large broken stripes on lighter ground; bloom conspicuous; dots large, indistinct; stalk three-fourths of an inch long; calyx deep set; flesh yellowish, mild sub-acid, good. Early winter. A thin bearer.

Brabant Bellefleur. Large, roundish or roundish-oblong; pale yellow, striped; calyx large; flesh firm, rich, sub-acid or rather acid, good flavor. Growth crooked, tree spreading. Winter.

Carthouse. (*Syn.* Gilpin, Red Romanite, of Ohio.) Medium or rather small, roundish-oblong, nearly regular, apex flattened; striped and shaded deep red on greenish yellow ground; stalk one-half to an inch long, slender; basin slightly furrowed, wide, distinct; flesh tough, crisp, fresh, agreeable, mild sub-acid, second-rate. Keeps fresh till late in spring. Much cultivated in Ohio valley and sold at New-Orleans.

Chandler. Rather large, roundish-oblate, often oblique or irregular, obscurely ribbed; color with a few distinct large broken stripes of yellowish red, and a shade of paler red on greenish yellow; stalk half an inch long; basin

rather deep; flesh greenish yellow, sub-acid, rich, nearly first-rate. Early winter. Origin, Pomfret, Conn.

Cornish Gilliflower. Medium size, ovate, apex ribbed, very narrow; dull green, with a brown cheek, slightly streaked; calyx large; flesh yellowish, firm, rich, high flavor. Ripe through winter. English.

Cos or *Caas.* Large, one-sided or angular, roundish, base wide, apex narrow; greenish yellow with red streaks; stalk short, cavity deep, one-sided; calyx small, basin shallow; flesh mild, sub-acid, agreeable, second-rate or nearly first-rate. Ripens through winter. A native of Kingston, N. Y.

Court-pendu. (*Syn.* Court-pendu plat.) Medium in size, flat, regular; color deep crimson on pale greenish yellow; stalk short, cavity deep; calyx large, basin wide; flesh yellowish, crisp, rich, acid. Early winter. Popular in Europe. French.

Dominie. Rather large, roundish-oblate; surface with narrow and distinct stripes of light red, on whitish yellow ground; dots or specks large, rough; stalk three-fourths of an inch long, cavity wide, deep, acute; basin deep, obtusely ribbed; flesh white, firm, mild sub-acid, spicy, fine-flavored. Shoots very long, vigorous, diverging, leaves drooping, coarsely serrate. Productive. Keeps through winter.

Dumelow's Seedling. Medium in size, round, flattened at ends; clear yellow, with a red blush; stalk very short; calyx large, open, deep, sunk; flesh yellow, crisp, with a very brisk sharp acid juice. A good culinary fruit. English.

Dutch Mignonne. Quite large, roundish, regular; rich orange, dotted, mottled, and obscurely striped with bright red, slightly russetted; stalk nearly an inch long, slender; calyx large, open; basin large, round, even; flesh firm, becoming tender, with a high, rich, rather acid flavor. Early winter. Native of Holland. A large, handsome, high-flavored, but rather coarse fruit.

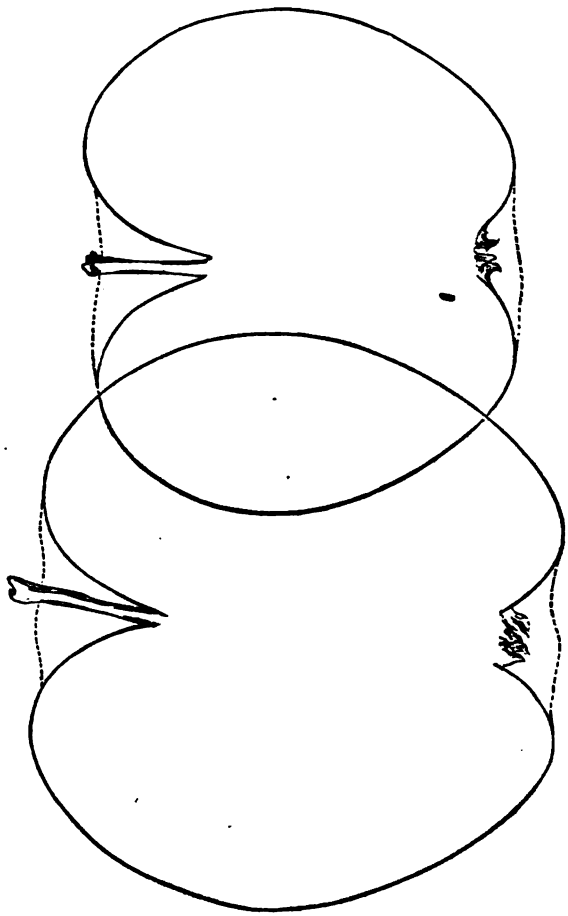


Fig. 119.—*Hubbardston Nonesuch.*

Fig. 120.—*Red Canada*, or *Old Nonesuch.*

Eustis.—(*Syn.* Ben.) Rather large, roundish, very slightly ovate; striped and dotted with light rich red on rich yellow; stalk very short; basin narrow, rather deep; flesh yellowish, rich, sub-acid, fine. Origin, Essex Co., Mass., New.

Golden Reinette. Small, regular, roundish-conical, slightly flattened at base; rich yellow with red; stalk long, cavity shallow; flesh yellowish, rich, mild sub-acid. Early winter.

HEREFORDSHIRE PEARMAIN. (*Syn.* Royal Pearmain, Winter Pearmain, erroneously.) Medium in size, round-oblong, approaching obtuse-conical; surface mostly covered with indistinct stripes and soft clouds of light red on greenish yellow, which on ripening becomes a pale, clear yellow;* stalk half an inch long, cavity small; calyx large, open; basin narrow, plaited; flesh yellowish white, fine-grained, with a pleasant, mild sub-acid, aromatic, fine flavor. Early winter. Best on light soils. Distinguished from Winter Pearmain by its more conical and less oblong form, and by the soft shades and clouds of fine red, which cover the surface.

Hoary Morning. Large, roundish, slightly oblate; broadly striped, covered with a downy or hoary bloom; cavity wide; calyx small, basin shallow, plaited; flesh firm, brisk, sub-acid. For cooking. English.

HUBBARDSTON NONESUCH. Large, round-ovate, largest at the middle, nearly regular; color with small broken stripes and numerous dots of light rich red on a rich yellow ground; stalk three-fourths to one inch long; cavity acute, russeted; calyx open, basin ribbed; flesh yellowish, very rich, slightly sub-acid, with a strong mixture of a rich sweet, flavor excellent. Early winter. Equal to the Swaar in richness, superior to the Baldwin in flavor. Shoots rather slender, grey. A native of Hubbardston, Mass.

JONATHAN. Medium in size, round-ovate, or approaching truncate-conical; regular; nearly covered with brilliant

"———— the fair Permain
Tempered, like comliest nymph, with red and white "—Phillips.

stripes of clear red on a pale yellow ground; stalk slender: basin very distinct, rather deep; flesh white, very juicy, spicy, sub-acid, moderately rich. Keeps through winter. Shoots slender, diverging; tree very productive; fruit always handsome and fair. A native of Kingston, N. Y.

Kentish Filbasket. Very large, roundish, slightly ribbed, greenish yellow, slightly streaked, sub-acid; only cooking. English.

Kirk's Lord Nelson. Large, roundish, regular; striped light red on greenish yellow, rather acid, flavor not high. Early winter. Handsome. English.

Laquier. (*Syn.* Lacker.) Rather large, oblate, somewhat irregular; striped light and dark red on greenish yellow; with conspicuous whitish specks; stalk half an inch long; basin furrowed; flesh white, fine-grained, firm, crisp, fresh, mild, agreeable, sub-acid. Keeps through winter. Cultivated in western New-York; originally from Lancaster, Pa.

Limber Twig. (*Syn.* James River.) Large, dull red, flesh yellowish, very compact, not high-flavored, but cultivated in the south and west for its keeping properties. The tree is ill-shapen, with pendant branches, whence its name. Distinct from the Willow Twig.

Lucombe's Seedling. Rather large, roundish, slightly angular, somewhat conical; greenish yellow in the shade, dashed and spotted with carmine in the sun; stalk short, basin small, plaited; flesh whitish, firm, not high flavored. Late autumn and early winter. A handsome, English, culinary fruit, of third quality.

Margill. Very small, slightly angular, dull yellow and orange; streaked and mottled with red; firm, high flavored, aromatic; growth slow. English.

Marston's Red Winter. Large, roundish oval, regular, slightly narrowed to each end, smooth; striped with bright red and crimson on yellow ground; stalk half an inch long, slender, cavity russeted; basin abrupt, round, smooth; flesh yellowish, fine-grained, tender, juicy, high-flavored. Ripens through winter. Origin, New Hampshire. New.

McLellan. (*Syn.* Martin.) Medium in size or rather large, nearly round, smooth, regular; striped and mottled with lively clear red on yellow ground; stalk three-fourths of an inch long, slender, cavity narrow; basin narrow, waved; seeds small; flesh nearly white, fine-grained, very tender, slightly sub-acid, agreeable, but not very rich. Early winter. Very productive. A native of Connecticut. New.

Minister. Large, rather irregular, oblong-conical, ribbed, surface more or less wavy, base broad, apex very narrow; very distinctly striped with red on greenish yellow ground; stalk one inch long, slender, cavity usually wide, shallow, and irregular; flesh yellowish, moderately rich, sub-acid, flavor second rate. Productive, fair, and showy. Early winter. Shoots somewhat flexuous.

Mother. Large, oblong-ovate, approaching conical; slightly and obtusely ribbed; color a high warm rich red on yellow ground; deep red to the sun,—in obscure broken stripes and spots; stalk three-fourths of an inch long, cavity moderate; basin small, plaited; flesh yellow, more so towards the outside, moderately juicy, rich, very spicy, very mild sub-acid, with an admixture of sweet. Somewhat resembles the Esopus Spitzenburgh in external appearance, and in its rich yellow flesh and spiciness, but nearly sweet in flavor, and less agreeable. Late autumn and early winter. Origin, Worcester Co., Mass.

Murphy. Rather large, round-oblong or round-ovate; distinctly striped with bright rich red on rich yellow; stalk one inch long, cavity wide, rather obtuse; basin narrow; flesh yellowish, mild sub-acid, good. Early winter. A native of Salem, Mass.

Norfolk Beaufin. Large, flat, dark dull copper colored or livid red in faint stripes; stalk short, fleshy; basin plaited, shallow; flesh hard, rather acid, poor flavor. Only for drying. Winter. English.

NORTHERN SPY. Large, roundish, slightly conical, often flattened, sometimes slightly ribbed, handsomely striped with red; stalk and calyx deep set; flavor mild agreeable, mild sub-acid, fine. Keeps through winter and late into

spring; preserves its flavor remarkably fresh. Shoots dark, spotted, erect, stout. To afford fine fruit, the tree must be kept thrifty by good cultivation. A native of East Bloomfield, N. Y.

Pennock. (*Syn.* Pennock's Red Winter.) Large, roundish, sometimes slightly oblong, flattened at ends, oblique; color deep dull red, with large white dots; stalk rather slender; flesh coarse, slightly sub-acid, rather rich, with a slight mixture of bitter and sweet, second or third rate. Very liable to dry rot. Popular in southeastern Pennsylvania, from its large size and showy appearance.

Pound. Very large, round-oblong, striped red on greenish yellow, stalk short, flavor poor.

Priestley. Medium or rather large, roundish-oblong, sometimes nearly round; light dull red in small stripes and numerous dots, with a dense bloom; stalk one inch long; basin small, furrowed; flavor sub-acid, spicy, good second rate. Growth upright.

Pryor's Red. (*Syn.* Pryor's Pearmain.) Medium or rather large, roundish, irregular, varying, apex often broad, sometimes narrow, considerably or slightly ribbed; color dull brick red on greenish yellow in dots, shades, and obscure streaks, slightly russeted; stalk long or short, cavity small; calyx open, basin narrow; flesh very tender, mild, rich, sub-acid, agreeable. Resembles in texture and flavor the Westfield Seeknofurther. Highly esteemed in Indiana, Kentucky, and Virginia,—where it keeps till spring,—and succeeds well further north.

Rawle's Jannet. (*Syn.* Rawle's Jenneting, Neverfail, Rockremain.) Medium in size, roundish, approaching oblong or obtuse conical, often oblique; color pale red distinct stripes on light yellow ground; stalk half an inch long; flesh nearly white, fine, rich, mild, sub-acid, fine texture, crisp, juicy, compact, about first rate. Growth slow; a profuse bearer, with a portion of the crop knotty or under size. Keeps through spring. Highly esteemed in the Ohio valley; does not succeed farther north. The blossoms open ten days later than usual,

thus sometimes escaping spring frosts; and hence the name Neverfail.

RED CANADA. (*Syn.* Nonsuch, Old Nonsuch of Mass., Richfield Nonsuch of Ohio.) Medium in size, roundish-conical, regular; nearly the whole surface covered with red, and interspersed with large and rather indistinct whitish dots; stalk about an inch long, in a very wide and even cavity; basin nearly even, moderate; flesh fine grained, compact, with a rich sub-acid, high and excellent flavor. Keeps through winter. Shoots rather slender, leaves wavy. Productive; fruit smooth and fair. Succeeds equally in New England, New York, and Ohio. This is wholly distinct from the Nonsuch of England, to prevent confusion with which, the name Red Canada is preferred.

Red Gilliflower. (*Syn.* Scolloped Gilliflower.) Large, flattish-conical, sometimes inclining to roundish or ovate-conical, very irregular and strongly ribbed; striped with dull dark red on greenish yellow ground; usually more or less blotched with dark spots or scabs; stalk half to three-fourths of an inch long; basin very irregular or strongly ribbed; flesh fine-grained, compact, rich greenish yellow, and with a fine, spicy, sub-acid flavor. Although of fine quality, the fruit is rarely fair, and the tree is unproductive; hence it is little cultivated.

Redstreak. Medium size, roundish, rich red and yellow in streaks; flesh yellowish, rich, firm, dry. For cider only.

Scarlet Nonpareil. Medium in size, roundish, regular, yellowish green, the sunny side deep red, stalk rather large; flesh firm, rich, acid. English.

SPITZENBURGH, ESOPUS. Rather large, round-ovate slightly conical; surface a high rich red, rather obscurely striped; stalk three-fourths of an inch long, rather slender; basin shallow, slightly furrowed; flesh yellow, firm, crisp, spicy, rather acid, nearly unequalled in its high rich flavor. Keeps through winter. Shoots ascending and erect, rather slender, leaves crenate. Usually a moderate bearer. Succeeds best in New-York, its native state.

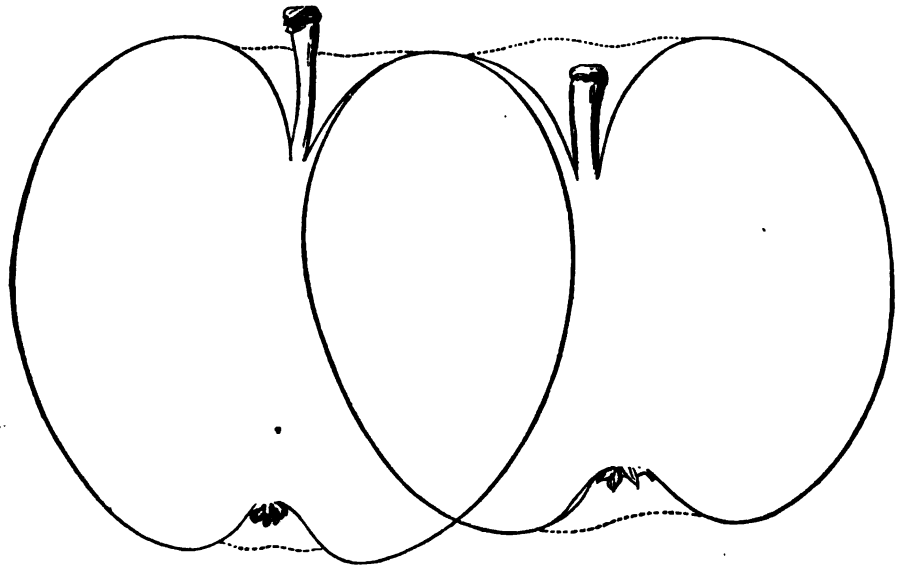


Fig. 123—*Esopus Spitzenburgh.*

Fig. 124—*Green Newtown Pippin*

Spitzenburgh, Flushing. Rather large, round-conical, red on greenish yellow; calyx small, basin even; flesh white, nearly sweet, pleasant, good second rate. Early winter. Growth strong.

Spitzenburgh, Kaighn's. Rather large, oblong-ovate; somewhat conical; striped with red on yellow; stalk slender, one inch long, cavity small, acuminate; basin rather deep; rather coarse. Proves to be a good second-rate fruit at Cincinnati, but north and east is unworthy of cultivation. Keeps through winter. Growth irregular. Origin, New-Jersey.

Spitzenburgh, Newtown. Medium size, roundish-oblate, smooth; a fine red cheek, with a few streaks of deeper red, on clear yellow; stalk short; basin wide, even; flesh yellowish, firm, flavor mild, agreeable. Origin, Newtown, Long Island.

VANDEVERE. Medium in size, round-oblate, regular; color light red in indistinct streaks on yellow ground, often a high red where exposed; dots numerous; stalk uniformly about half an inch long, cavity and basin wide; flesh light yellow, with a rich, mild, sub-acid, excellent flavor. Early winter. Not always fair—succeeds best on light soils. Shoots spotted; leaves doubly serrate-crenate. Origin, Wilmington, Del.

WAGENER. Medium or rather large, oblate, obscurely ribbed, shaded and indistinctly striped with pale red, and a full, deep red in the sun, on warm yellow ground; often streaked with russet; stalk three-fourths of an inch long, cavity wide, rather obtuse; basin even, rather large; flesh yellowish, very fine grained, tender, compact, mild, sub-acid, very aromatic, excellent. Ripens through winter. A native of Penn Yan, N. Y. New.

Watson's Dumpling. Very large, nearly round, regular; yellowish green, faintly striped; stalk short; flesh juicy, pleasant, sub-acid. For cooking. Early winter. English.

Wells Apple. Rather large, roundish-conical, slightly oblate; bright yellowish green and red; basin shallow;

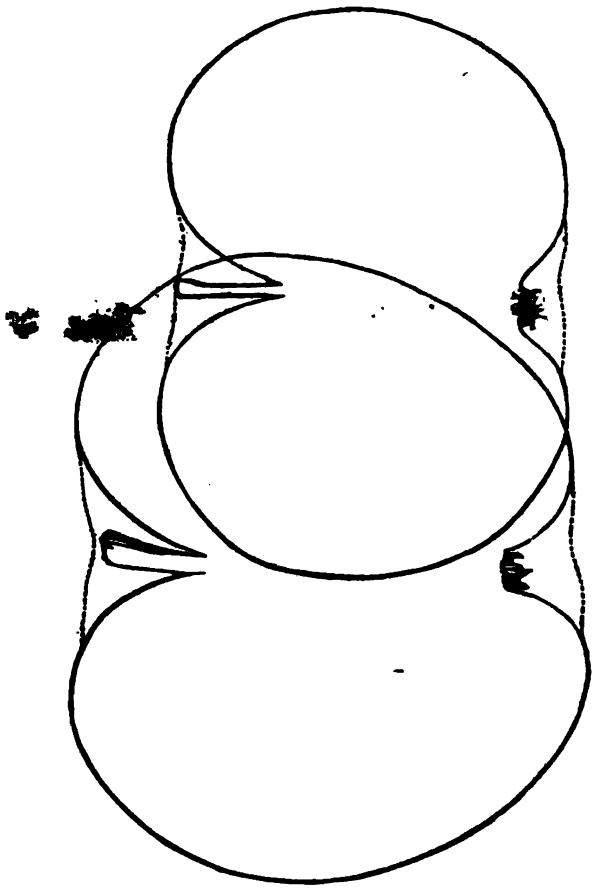


Fig. 121—*Northern Spy.*

Fig 122—*Wagener.*

sprightly sub-acid. Fine baking. Shoots slender; tree very productive. Central Ohio.

WESTFIELD SEEKNOFURTHER. (*Syn.* Connecticut Seeknofurther, New-England Seeknofurther.) Medium or large, roundish, often slightly conical, obscurely striped with light dull red, more or less russeted, rarely covered wholly with russet; stalk slender; calyx partly open; flesh tender, rich, spicy, of fine flavor. Early and mid-winter. Tree productive, fruit always fair. Leaves sharply serrate. Succeeds well throughout the northern states and Ohio.

Willow Twig. Large, roundish, slightly conical, obtuse, very regular; greenish yellow, striped and mottled faintly with dull red; stalk short; basin very wide [redacted] deep, rim obtuse; flavor sub-acid or rather acid, [redacted] long keeper. Shoots very slender. Cultivated much as a market apple in southern Ohio.

Wine. (*Syn.* Hays' Apple, Hays' Winter.) Rather large, often quite large, roundish, slightly flattened; obscurely striped and mottled with red on yellow ground; stalk quite short, cavity deep, acuminate; calyx large, open, basin large; flesh yellowish white, with a rich sub-acid or rather acid flavor. Early winter. There are several spurious varieties under this name.

Winesap. Size, medium; round-ovate, slightly conical, sometimes obscurely flattened; color a lively deep red; stalk slender, three-fourths of an inch long, cavity acute; calyx small, in a finely plaited basin; flesh yellowish, firm, crisp, with a rich sub-acid or rather acid flavor. Keeps through winter. One of the best apples for baking. Growth rather irregular, fruit always fair. Differs from the Jonathan, in its smaller size, yellower flesh, smaller basin, and rather inferior quality.

Winter Pearmain. (*Syn.* Autumn Pearmain, erroneously, Old Pearmain.) Size, medium; oblong-ovate, ends somewhat flattened; color, narrow broken stripes of dull red on greenish yellow; stalk half an inch to one inch long, quite slender, cavity narrow; basin small, distinct,

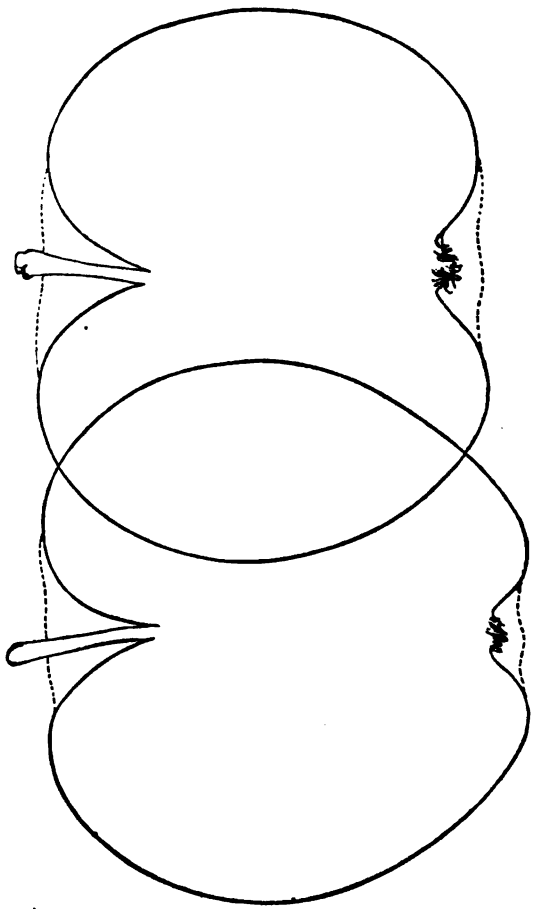


Fig. 121.—*Sweet.*

Fig. 122.—*Belmont.*

wrinkled; flesh dull yellow, or greenish yellow, tender, with a pleasant, sub-acid, lemon flavor. Does not freeze easily.

Winter Queen. (*Syn.* Winter Queening.) Medium size, conical, base broad; deep crimson in the sun, a lively pale red in the shade. Stalk slender, three-fourths of an inch long, cavity wide; flesh yellowish, mild sub-acid, rather pleasant. Productive. Early winter. N. J.

Yorkshire Greening. Rather large, oblate, slightly ribbed; dull, dark green, slightly tinged and striped with muddy brown and dull red; stalk short, thick; cavity and plaited basin, shallow; flesh firm, greenish white, juicy acid. Through winter. A fine English culinary apple.

Section II.—Not striped.

Albemarle Pippin. Size, medium or rather large, nearly round; yellow with brown specks; flesh pale yellow, sub-acid, with a very fine flavor. Keeps well. Cultivated chiefly in Virginia, and in great abundance in Albemarle County, at the foot of the Blue Ridge, and is sent to the Richmond market.

Alfriston. Large, roundish, a little ribbed, slightly conical, pale greenish yellow, slightly russeted, stalk short, tender, rather acid, third rate.

Bedfordshire Foundling. Large, roundish, green, stalk short, calyx open, flesh yellowish, pleasant acid, cooking. Early winter. Handsome.

Belmont. (*Syn.* Gate, Waxen of Coxe?) Rather large, roundish conical or ovate-conical, apex usually narrow, but sometimes quite obtuse; faintly ribbed, smooth; color clear pale yellow, with sometimes a light vermillion blush; and rarely with large thinly scattered carmine dots; stalk varying from half an inch long and stout, to an inch or more long and slender; basin in conical specimens, narrow and shallow; in obtuse specimens, narrow and deep, with an obtusely ribbed rim; flesh yellowish white, compact, crisp, becoming quite tender, with a mild, rich, sub-acid, fine flavor. Leaves crenate.

Early winter. A profuse bearer. Excellent in New York, Michigan, and northern and central Ohio—worthless at Cincinnati.

The identity of this fruit with the Waxen of Coxe, not having been established, the old name Belmont, (of Kenrick) extensively used in most places where it is cultivated, is here adopted.

Borsdorff. (*Syn.* Borsdorffer.) Small, roundish oval, apex slightly conical; pale yellow, with a full red cheek; stalk short, slender; basin very shallow, small, even; flesh yellowish white, firm, crisp, with a rich, brisk flavor. Early winter. German.

Bourassa. Rather large, ovate-conical, ribbed, somewhat irregular, a rich orange russet on a rich golden surface, dark reddish brown to the sun; stalk an inch and a fourth long, cavity small, irregular; basin small and narrow; flesh fine-grained, sub-acid, rich, fine. Succeeds well far north.

Bullock's Pippin, or American Golden Russet. (*Syn.* Golden Russet, Sheepnose.) Rather small, conical, light yellow, sprinkled and sometimes overspread with thin russet; stalk long, slender; basin very small and narrow; ribbed; flesh yellowish white, very fine grained, becoming very tender, with a mild, rich, slightly sub-acid flavor. Growth erect, shoots rather slender; leaves sharply serrate; tree overbears. Early winter. When well ripened, this apple is exceedingly delicate and tender; sometimes it does not become soft in ripening, when the quality is poor, and often worthless. It is too small to become very popular.

Canada Reinette. (*Syn.* Reinette du Canada, Canadian Reinette.) Quite large, somewhat conical and flattened; rather irregular, ribbed, apex obtuse; greenish yellow, sometimes a brown cheek; stalk short, cavity wide; calyx large, basin rather deep, irregular; flesh nearly white, rather firm, becoming quite tender, juicy, with a good, lively sub-acid flavor. Early and mid-winter.

The *White Pippin* of southern Ohio, closely resembles the Canada Reinette in form, and may prove identical.

Catshead. (*Syn.* Cathead Greening.) Very large, round,* pale green, stalk half an inch long, cavity deep, basin wide, deep; tender, sub-acid; flavor rather poor.

Court of Wick. Rather small, regular, round-ovate, slightly flattened; greenish-yellow, with an orange red cheek; stalk short; calyx open, basin wide, shallow; flesh crisp, juicy, with a high acid flavor. Hardy, suited for the extreme north. English.

Cranberry Pippin. Rather large, regular, oblate, very smooth; color, a beautiful blush on pale clear yellow, often with large red dots on the sunny side; stalk slender, three-fourths of an inch long; calyx deep set, basin round, with a full obtuse rim; flesh white, sub-acid, second-rate flavor. Early winter. Exceedingly beautiful; resembles Maiden's Blush, but later, and not equal in quality.

Cumberland Spice. Rather large, varying from roundish-conical to long conical, the tapering sides being nearly straight and not rounded; color, waxen yellow, with a slight vermillion tinge near the base; and with black specks on the surface; stalk half to three-fourths of an inch long, cavity wide, slightly russeted; calyx open, basin even; flesh yellowish-white, breaking, rather light; core hollow; flavor mild sub-acid, with a peculiar and agreeable spiciness, of good second-rate quality. This has been confounded with the Ortley or White Detroit of the west, but is quite distinct.

Aunt Hannah. Size medium, roundish, approaching ovate, straw color, with a very pleasant mild sub-acid, fine flavor, resembling in character the Newtown Pippin. Origin, Essex county, Massachusetts.

English Golden Russet. (*Syn.* Golden Russet of New-York.) Size medium; roundish, usually a little oblong, sometimes slightly flattened, nearly regular; surface sometimes wholly a thick russet; and at others a thin broken russet on a greenish-yellow skin; stem slender, from half an inch to an inch long, being longest on ob-

* "—— the Cat's-Head's weighty orb
Enormous of its growth."—*Phillips.*

late specimens;* flesh fine grained, firm, crisp, with a rich, aromatic flavor. Shoots speckled; tree rather irregular. Keeps through winter. This is distinct from the English Russet, of straight upright growth, and a very long keeper; and from the *American* Golden Russet or Bullock's Pippin.

English Russet. (*Syn.* Poughkeepsie Russet.) Medium in size, roundish-conical or roundish-ovate, regular; surface more or less overspead with brownish russet on light greenish yellow ground; in large exposed specimens, wholly russeted; stalk one-half to three-fourths of an inch long, cavity moderate, round; basin smooth; flesh greenish or yellowish white, texture fine, rather firm, with a rather rich, aromatic, sub-acid flavor. Keeps through spring, and often through summer for twelve months. Growth upright, shoots lively brown. A profuse bearer. A profitable market variety.

It is distinguished from the English Golden Russet and Roxbury Russet, by its straight upright shoots; and from the Roxbury by its less flat form, and less acid flavor.

Fallawater. Rather large, roundish, and slightly ovate-conical, very regular, smooth; color, a smooth shade of dull red on light greenish yellow, with a few large, whitish dots; stalk slender, cavity narrow, acuminate; basin small; flesh greenish white, fine-grained, with a mild, slightly sub-acid, good second-rate flavor. Early winter. A native of Pennsylvania.

Fenouillet Gris. (*Syn.* Pomme d'Anis.) Small, roundish, slightly flattened, russeted on yellow ground; calyx small; flesh firm, perfumed, anise-flavored. Leaves very small, growth weak and slender.

Fenouillet Jaune. (*Syn.* Embroidered Pippin.) Small, regular, bright yellow, with russet net-work; stalk short, calyx small; flesh firm, with a high, aromatic flavor. Tree low. Through winter.

Fenouillet Rouge. Rather small, regular, roundish, a little flattened; dark brown red on greyish ground; stalk short; with a firm flesh, and rich, perfumed flavor.

* In all instances, where apples vary from oblate to a more elongated form, the stem is longer in the oblate specimens.

FORT MIAMI. Rather large, roundish-oblong, flattened at the ends, widest at base; uneven, somewhat ribbed; color dull brown, obscurely russeted; stalk three-fourths of an inch long, cavity rather wide, irregular; basin furrowed; flesh yellowish white, crisp, and of exceedingly high, spicy, sub-acid flavor. Keeps through spring. Ohio. New.

Golden Ball. Large, often quite large, roundish, remotely conical, ribbed; fine yellow; stalk short, slender, with fine green rays or furrows radiating from the centre of the cavity; basin very shallow; flesh tender, rich, aromatic. Ripens late in autumn, and keeps through winter. Liable to vary in size and fairness. Excellent for cooking. Tree very hardy; a poor bearer. Cultivated chiefly in Maine.

Golden Harvey. Small, roundish, irregular; dull russet on yellow; a reddish cheek; calyx open, stiff; flesh of fine texture, spicy, rich, sub-acid. Keeps through winter. Growth slender.

Golden Pippin, English. Small, round, regular, rich yellow, dots in the form of short cross-bars; stalk long, slender; basin shallow; flesh yellow, rich, with a fine, sub-acid, first-rate flavor. Keeps through winter.

Green Seeknofurther. (*Syn.* Seeknofurther, of Coxe.) Large, often quite large, roundish, slightly approaching oblong obtuse conical; greenish yellow becoming yellow, specks large and conspicuous; stalk very short; calyx large, basin slightly ribbed, deep; flesh rather coarse, sub-acid or rather acid, of good flavor. This differs from the White Seeknofurther of New England, in its larger size, more conical form, coarser texture, and inferior quality. Growth strong and vigorous, upright.

Lady Apple. (*Syn.* Pomme d'Api.) Quite small, regular, flat; a brilliant deep red cheek on light clear yellow; stalk and calyx deep set; flesh tender, delicate, sub-acid, flavor good. A fancy apple. Winter and spring. Shoots small, dark, erect. Productive. Subject to fire-blight in some localities.

Lady Apple, black. Resembles the preceding in form, but nearly black, and destitute of good flavor. Cultivated only as a curiosity, from its almost inky blackness.

Loudon Pippin. Large or very large, roundish, slightly flattened, obtuse-conical; greenish yellow; stalk very short; calyx large, in a smooth even basin; flesh sub-acid, of a good second rate flavor. Early winter. Much cultivated in northern Virginia; and from its large size and handsome appearance sells in the Washington market for about twice as much as any other sort. Productive.

Male Carle. (*Syn.* Mela Carla, Pomme de Charles.) Medium size, regular, slightly conical; smooth, clear pale waxen yellow, with a brilliant crimson cheek; stalk one inch long, slender; basin rather narrow and deep; flesh tender, moderately juicy, with a delicate flavor. A native of Italy; succeeds in the middle States, unsuccessful in New York and New England. Early winter.

Michael Henry Pippin. Size, medium; roundish-ovate, apex narrow; yellowish green; stalk short, rather thick; basin narrow; flesh yellow, tender, juicy, high flavored. Growth upright. Through winter. Origin, Monmouth Co., N. J.

Monstrous Pippin. (*Syn.* Gloria Mundi, Ox Apple, Baltimore.) Very large, roundish, somewhat flattened at the ends, slightly angular or ribbed; skin smooth whitish green, becoming whitish yellow; stalk stout, short; calyx large, basin wide, deep, somewhat ribbed, with an obtuse rim; flesh white, tender, rather coarse, with a sub-acid, not rich, second or third rate flavor. Late autumn and early winter.

Mouse. (*Syn.* Moose.) Large, rounish-oblong or slightly ovate conical; pale green becoming greenish yellow, with a brownish blush; stalk three-fourths of an inch long, rather slender; basin narrow, slightly plaited; flesh white, fine-grained, spongy, delicate, mild, sub-acid. A native of Ulster Co., N. Y. Through winter.

NEWTOWN PIPPIN. (*Syn.* Pippin, Green Newtown Pippin.) Medium or rather large, roundish, oblique, slightly

irregular, remotely conical or else a little flattened; dull green becoming yellowish green; often with a dull brownish blush; stalk short, deep set, and surrounded by thin, dull, whitish russet rays; basin narrow, shallow; flesh greenish white, juicy, crisp, fine-grained, with a high, fine flavor. Keeps through spring, and retains remarkably its freshness. Tree of rather slow growth, with a rough bark. The fruit is very liable to black spots or scabs, unless under high, rich, and constant cultivation, with a good supply of lime in the soil. One of the best fruits for foreign markets. A native of Newtown, Long Island, and has rarely succeeded well in New-England.

Newark King. Size, medium; conical; skin smooth, red in streaks on yellow ground; flesh tender, rather rich, pleasant. Early winter. Origin, New Jersey.

Newark Pippin. (*Syn.* French Pippin.) Rather large, round-oblong, regular; greenish yellow, becoming yellow; stalk and calyx deep set; flesh tender, rich, and high-flavored. Growth crooked, irregular. Early winter.

Old Nonpareil. Rather small, round-ovate, flattened; greenish yellow with pale russet, stalk slender, calyx small; flesh rich, acid, sharp. Early winter. English.

Ortley, or White Detroit. (*Syn.* Ortley Pippin, Warren Pippin, White Bellflower, Woolman's Long, Detroit, Jersey Greening, Detroit of the West.) Large, roundish, somewhat oblong-ovate, pale yellow, slightly tinged with pink in the sun; stalk about an inch long, sometimes short, but always slender; cavity deep and narrow; basin rather deep, nearly even or slightly plaited; flesh sub-acid, crisp, sprightly, rich, fine, about first rate. Shoots slender.

Peck's Pleasant. Large, often quite large, roundish, sometimes remotely oblong, often a little oblique, usually slightly flattened; smooth and regular; color, light green, becoming yellow, with a brown blush; stalk very short, one-fourth to one-half an inch long, thick, rarely longer and somewhat slender; calyx open, basin abrupt, rather

deep; flesh compact, very tender, with a mild, rich, fine, clear sub-acid, Newtown Pippin flavor. Early winter—poor, if too ripe. Growth rather erect, shoots somewhat diverging; a good bearer, fruit always fair. The fruit resembles the Yellow Newtown Pippin, but larger, fairer, and earlier in ripening. Origin, Rhode Island.

Pickman. Rather large, round, light yellow, with black specks; flesh firm, juicy. Through winter. A fine culinary variety.

Pomme Grise. (*Syn.* Gray Apple.) Rather small, roundish-oblate, a grey russet; stalk slender, cavity wide, rather obtuse; calyx small, basin round; flesh very tender for a Russet and fine-grained, rich, and high-flavored. Canada. One of the best dessert apples for the extreme north.

Pound Royal. (*Syn.* Pomme Royale, erroneously, Belle Bonne, of Conn.) Large, roundish, slightly oblong, a little uneven; surface whitish yellow; stalk slender, an inch and a quarter long, cavity large; basin furrowed, irregular; flesh tender, breaking, fine-grained, mild, agreeable, sprightly. Ripens through winter. Tree vigorous, productive. Origin, Pomfret, Conn.

RHODE-ISLAND GREENING. (*Syn.* Greening.) Large, roundish-oblate; green, becoming greenish yellow, always fair, a dull brown blush to the sun; stalk three-fourths of an inch long; basin rather small, often slightly russeted; flesh yellow,—a rich yellow if much exposed to the sun, and whitish yellow or greenish white if much shaded,—tender, juicy, with a rich rather acid flavor. Growth strong, young trees crooked or oblique, shoots rather spreading, leaves sharp serrate; best on light soils; very productive, single trees often yielding forty bushels of fair fruit in favorable years, and neglected orchards 500 bushels per acre. Fine throughout the Northern States, where it keeps through winter into spring; but fails from a deficiency in the soil, through most parts of central and southern Ohio; and at Cincinnati and St. Louis becomes an autumn fruit.

Roman Stem. Medium in size, round-ovate; whitish yellow, with a faint brownish blush; stalk one-half to three-fourths of an inch long, with a fleshy protuberance at insertion; cavity shallow; basin narrow, slightly plaited; flesh tender, juicy, mild, sub-acid, good second rate flavor. Keeps through winter. New Jersey.

ROXBURY RUSSET. (*Syn.* Boston Russet, Putnam Russet of Ohio.) Medium or large, roundish-oblate, remotely conical, partly or wholly covered with rather rough russet on greenish yellow ground, sometimes a dull brown cheek; stalk one-half to an inch long, cavity acute; basin round, moderate; flesh greenish white, rather granular, slightly crisp, with a good sub-acid flavor. Keeps late in spring. Large specimens become conical, with short thick stalks; small specimens are more flat, and with longer and more slender stalks. Growth spreading, shoots downy. Although not of the highest flavor, its productiveness, uniformly fair fruit, and long keeping, render this variety one of the most profitable for orchard culture. It succeeds well throughout the Northern States, but partially fails in a few localities in Ohio.

The Warner Russet (new) resembles the Roxbury, but is a finer and more vigorous grower.

Sam Young. Small, regular, oblate; bright yellow, partly russetted; stalk short; calyx large, open; flesh greenish, juicy, with a rich, fine flavor. Early winter. Irish.

Shippen's Russet. Large, roundish-ovate, flattened, tapering to apex; mostly russeted on greenish yellow ground, tinged red in the sun; stalk three-quarters of an inch long, deep set; basin small; flesh rather spongy, sub-acid or rather acid, second rate.

Surprise. Small, round-ovate, skin light yellow, flesh light dull red, flavor poor. A curiosity on account of its yellow skin and red flesh.

SWAAR. Rather large, roundish, slightly flattened at the ends, often considerably oblate, sides regularly rounded, crown as wide as base; color greenish yellow becoming a rich yellow, sometimes faintly russeted; and a small

blush near the base, when much exposed to the sun; stalk rather slender, three-fourths of an inch long, cavity round, moderate, or often small; basin small, even; flesh yellowish, fine grained, compact, tender, with a very rich, mild, aromatic, agreeable, slightly sub-acid flavor. Esteemed by many as the finest winter table apple. Ripens through winter and keeps into spring. Shoots ascending, buds large, leaves coarsely rounded serrate. Fruit apt to be scabby on old overloaded trees. Not successful in all localities.

Sweet and Sour. A middle sized fruit, with greenish ribs and whitish hollows; the former sub-acid, and the latter with an insipid or sweet flavor, occasioned by a partially diseased action, not unlike that of the whitish streaks in the leaves of *striped* or *ribbon grass*. The wildly absurd story of raising this fruit by placing two halves of dissimilar buds together, is wholly fabulous.

Tewksbury Blush. (*Syn.* Tewksbury Winter Blush.) Small, round-oblate; yellow with a red cheek; flesh yellow, juicy, with a good flavor. Keeps till mid-summer. Very productive. New-Jersey.

Victorious Reinette. (*Syn.* Reinette Triomphante.) Large, roundish-oblong, tapering very slightly each way from the middle; regular, often a little oblique; pale yellow, with rough specks; stalk half an inch long, cavity very deep; flesh yellowish, rather firm, of second-rate sub-acid flavor.

White Seeknofurther. Size medium; roundish oblate, slightly obtuse-conical, very pale green becoming yellowish, with whitish specks faintly ribbed; stalk very short, thick, cavity small; basin moderate or rather deep, slightly ribbed or uneven; flesh very fine grained, juicy, mild sub-acid, very agreeable, fine flavor. Cultivated in New-England. Fruit often defective. This is distinguished from the green Seeknofurther of Coxe by its smaller size, and far more delicate texture.

White Winter Calville. Large, rather flat, broadly ribbed, irregular; color, pale greenish yellow, becoming yellow; stalk three-fourths of an inch long, slender, deep set;

basin deep, irregular; flesh white, granular, tender, light, flavor faintly sub-acid, third-rate. Early winter. French. Culinary.

WINTER CHEESE. Medium in size; green in the shade, red in the sun; flesh very crisp, very tender and delicate, sprightly, and of a fine, pleasant flavor. One of the most highly esteemed early winter apples of southern Virginia, closely resembling the Fall Cheese, but a longer keeper. Becomes mealy and insipid after maturity.

WOOD'S GREENING. Large, roundish, a little oblique, slightly flattened, obscurely conical; pale green, smooth; stalk very short, cavity acuminate; calyx rather large, basin distinct, slightly plaited; flesh greenish white, or nearly white, fine grained, slightly crisp, tender; flavor very agreeable, mild sub-acid, first-rate, but not very rich.

YELLOW BELLFLOWER. (*Syn.* Bellflower, Yellow Belle-fleur.) Large, often quite large, oblong-ovate, apex quite narrow and conical, more or less irregular; surface pale yellow, often with a blush; stalk slender; basin ribbed; seeds long; flesh very tender, fine grained, crisp, juicy, acid, becoming sub-acid; excellent. Keeps through winter. Shoots yellowish, rather slender, growth of the tree rather upright; succeeds best on rather light soils. Adapted to the climate of the northern and middle states, as far south as Kentucky, but fails by premature dropping in a few localities. More tart and less rich in cold summers, and far north.

YELLOW NEWTOWN PIPPIN. Medium or rather large, roundish, slightly oblong and oblique, more or less flattened; yellow, with a brownish red cheek, purplish before ripe, stalk very short; flesh firm, crisp, with a rich, mild flavor. Closely resembles the Green Newtown Pippin, and believed by many to be identical, differing only by a warmer exposure. It is fairer in some localities than the Green, but is usually inferior to it in flavor. The growth of the two varieties is only distinguished in the large trees.

COMPARATIVE FORMS OF APPLES,

ON A SCALE ONE-HALF THE DIAMETER, ACCURATELY REDUCED FROM ACTUAL SPECIMENS.

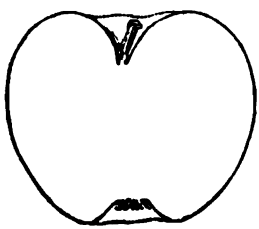


Fig. 125—*Herefordshire Pearmain.*

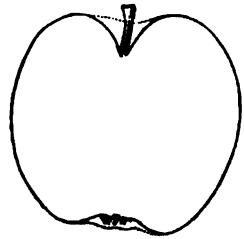


Fig. 126—*Winter Pearmain*

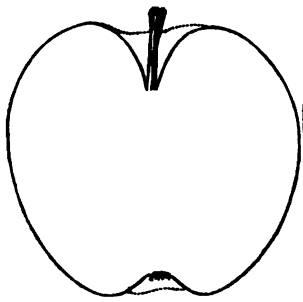


Fig. 127—*Orley, or White Detroit.*

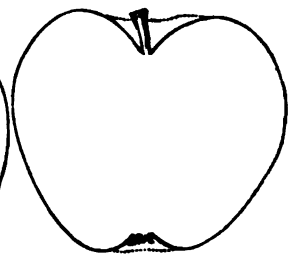


Fig. 128—*Cumberland Spice.*

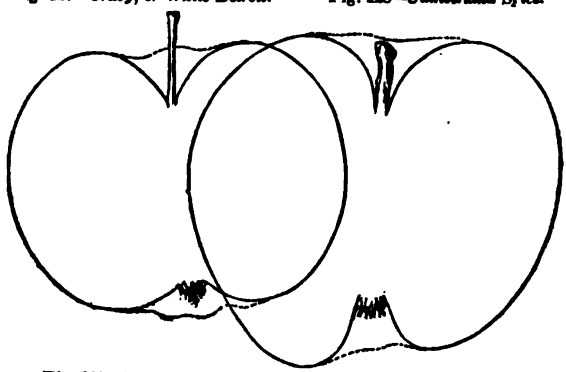


Fig. 129—*Holland Pippin.*

Fig. 130—*Pall Pippin.*

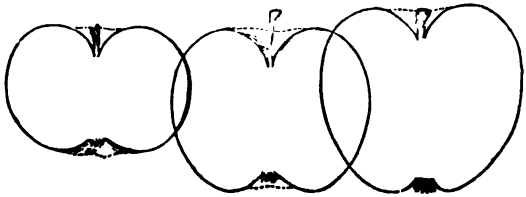


Fig. 131. *Lady Apple.*

Fig. 132. *English Golden Pippin.*

Fig. 133. *Early Red Margaret.*

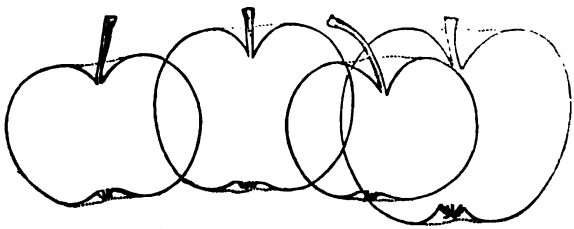


Fig. 134. *Two specimens White Juneating.*

Fig. 135. *Two specimens Ross Nonpareil.*

Showing the tendency to elongation of the stalk as the fruit assumes a smaller size and more oblate form.

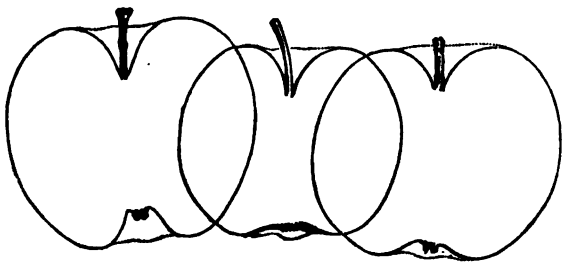


Fig. 136—*Jonathan.* Fig. 137—*Carthouse.* Fig. 138—*Fameuse.*

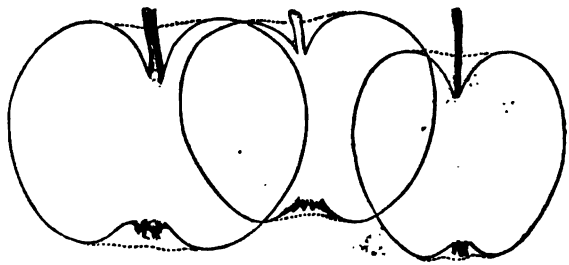


Fig. 139. *Roxbury Russet.*

Fig. 140. *English Russet.*

Fig. 141. *Bullock's Pippin, or Am. Golden Russet.*

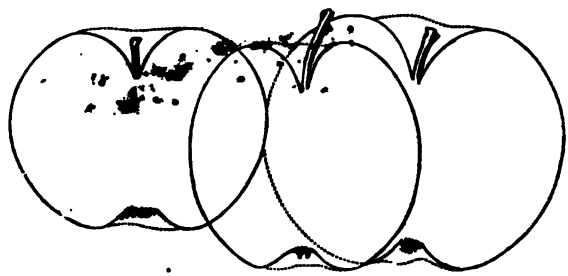


Fig. 142. *Peach Pond Sweet.*

Fig. 143. *Jersey Sweeting.*

Fig. 144. *Leland Spice.*

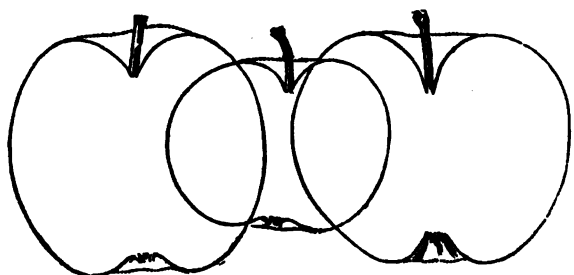


Fig. 145. *Am. Summer Pearmain.*

Fig. 146. *Garden Royal.*

Fig. 147. *Late Strawberry.*

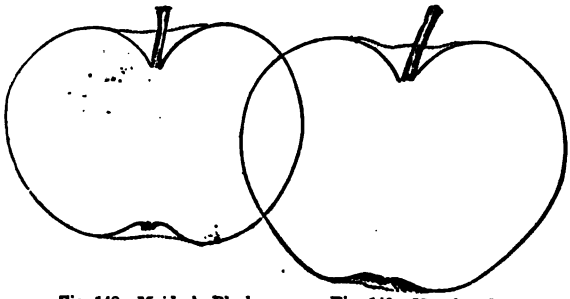


Fig. 148—*Maiden's Blush.* Fig. 149—*Hawtherndon.*

Fig. 150—*White Seaknofurther.* Fig. 151—*Green Seaknofurther.*

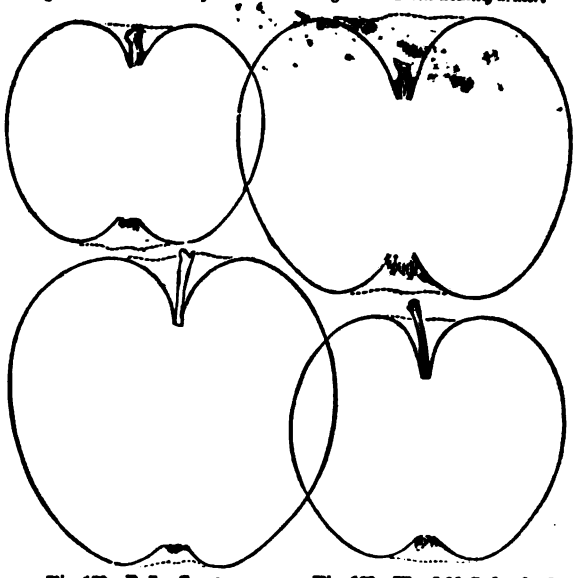


Fig. 152—*Bailey Sweet.* Fig. 153—*Westfield Seaknofurther.*

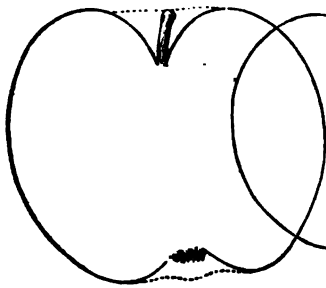


Fig. 154—*Summer Sweet Paradise.*

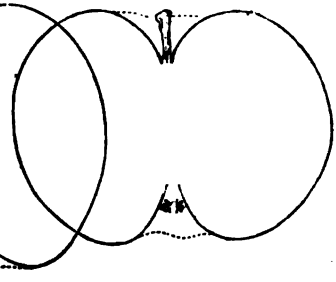


Fig. 155—*Haskell Sweet.*

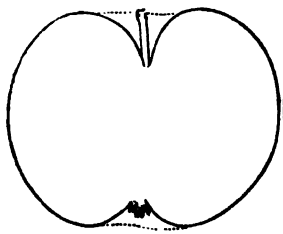


Fig. 156—*Sweet Baldwin.*

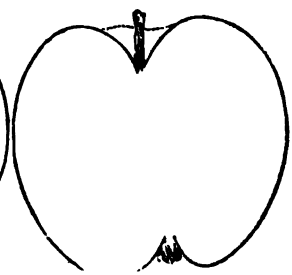


Fig. 157—*Mother.*

CHAPTER II

THE PEAR.

THE PEAR, when grown to full perfection, is eminently distinguished for its great delicacy, its melting and juicy texture, and by its mild, exceedingly rich, and delicious flavor. Greatly excelling the apple in these particulars, it falls below it in importance only in consequence of the less uniformly healthy habit of the tree.

PROPAGATION.

The best trees are raised from seedling stocks; suckers, unless unusually furnished with fibrous roots, are of crooked, one-sided, and stunted growth. Seedling pears are more difficult to raise than those of any other kind of fruit; and the many disasters to which the young trees are liable, have caused a great and general deficiency, in the midst of an abundant supply of trees of other kinds in the nurseries of this country.

Raising the Seedlings. The seeds, after separation from the fruit, should be kept in the way already given for apple-seeds, by mixing with sand or muck. The soil for the seed-bed, should be unusually deep and fertile, rather damp than otherwise, and should have a good manuring with lime and ashes, and an abundant supply of peat or muck, if the soil is not already largely furnished by nature with this ingredient. A correspondent of the Horticulturist states that he has been eminently successful by the following practice: First make a deep trench with the plow, and finish to the required depth with the spade—*two feet*—not less. The compost used to fill the trench is made of half a peck of iron filings or blacksmith's cinders, with half a peck of slaked lime, and half a peck of wood ashes, and a peck each of swamp muck and barn-yard manure, thoroughly mixed with

a bushel of soil into a compost. J. Washburn, of Plymouth, Mass., also furnishes the following statement:—"I have a fine lot of pear seedlings, which were [very copiously] manured with compost in the following proportions:—one load of muck, two loads of stable manure, two barrels of iron rust, one barrel of bone-dust, and two barrels of wood ashes. The whole was composted early in autumn—applied in the fall—and the seed sown the first of May. Other seeds planted on the same land without this compost, but with stable manure, have produced plants that *rusted* badly, and are not one quarter the size of the first lot, which are fine, strong stocks."

The mode of sowing the seeds may be the same as that described for the apple, in drills one to two feet apart. The more thinly they are sown, the less will be the danger of disaster from the leaf blight; and for this reason, drills near together, with the seeds somewhat sparingly scattered in them, will be found best.

The leaf-blight is the most serious evil met with in the cultivation of pear seedlings. Its immediate cause has not been satisfactorily explained. It is more formidable in some seasons than in others. Commencing about midsummer, sometimes earlier, but more frequently later, it is first indicated by the leaves in certain parts of the seed-beds turning brown; in a few days they fall off; other portions of the beds are successively attacked, till all the seedlings become more or less denuded, those last affected occupying the most favorable portions of the soil. As a necessary consequence, growth immediately ceases; and if they are attacked early, and have made but little previous growth, they are nearly ruined, and few will survive the succeeding winter, for they never make a second growth the same year of any value. But if their previous growth has been vigorous, and the blight appears late in summer, much less injury is sustained. The best remedy is the high cultivation, with special manures, already described.

Wintering the young seedlings. The frequent destruction of the trees the first winter, is another serious evil. The danger is least with those that have made the best well ripened growth; hence it becomes very important to secure healthful vigor by the adoption of the compost and

cultivation previously mentioned. But in many localities, pear seedlings, which are always remarkably free from fibrous or lateral roots the first year, are drawn out by the freezing of the soil, and either destroyed or greatly injured. Several modes have been proposed to prevent this result, and have been tried to a greater or less extent. One, is to induce the emission of lateral roots, by taking up the young seedlings from the thickly sown beds, early in the season and as soon as four leaves have appeared, cut off their tap roots, and reset them in the nursery rows. Robert Nelson, of Newburyport, Mass., has pursued this course with great success; but its general utility may be questioned, except during a rainy period or on favorable soils, unless abundant watering is given. A more easy as well as safe mode would perhaps be to cut off the tap roots, at the same age, by means of a sharp spade thrust beneath the soil, and without transplanting. Neither of these modes could be successfully applied except to large, vigorous seedlings, growing in a deep, rich soil.

But where the growth of lateral roots has not been effected, and the consequent danger greater, of their being drawn upwards by frost, much protection may be given them by covering the whole ground with forest leaves to a depth of several inches; and if the rows are near each other, and the trees several inches or a foot high, they will prevent the leaves from being swept off by the winds. The incursion of mice may be avoided by placing the seed-beds as near as practicable to the middle of a clean plowed field, and by encircling the ground with a bank or ridge of fresh earth, thrown up for this purpose, about a foot high. Mice will not pass such a boundary under the snow.

Taking up the seedlings late in autumn, and burying them in a cellar, or laying them in by the roots and nearly covering the whole stems, will preserve them safely; but this mode is liable to the objection of the check in growth necessarily given in transplanting.

Budding and Grafting may be performed the second summer if the stocks have made a good growth. The management of the young trees is the same as with apples, by grafting or budding near the surface of the ground, and heading down, trimming, and cultivation. But as pear

stocks are valuable, budding is to be preferred to grafting, because it may be repeated in case of failure. For the same reason, root-grafting the pear is not adopted, especially as slightly unfavorable causes are apt to produce far greater failures of such grafts than with the apple.

Propagation by Layers, giving every tree roots of its own kind, is easily effected by bending down a vigorous and thickly branched tree, and making layers of every good shoot. In two years at furtherest they will furnish well rooted young plants.

DWARF PEARS.

For orchard culture, and in most parts of the country where the pear flourishes with great vigor and proves highly productive, pear stocks will doubtless always be found greatly preferable to all others. The advantages of a dwarf growth on dissimilar stocks, have been already pointed out under the head *stocks*. Such trees are not so long-lived as on pear roots, and they require more thorough and fertile culture, and care in pruning. But they have some important advantages, such as coming soon into bearing, occupying less than a fifth part of the ground, thriving in many soils where pear stocks will not, and in a few instances improving the quality of the fruit.

The stocks for dwarfs, which have been more or less used, are the mountain ash, the apple, the thorn, and the quince.

Nearly all the experiments with the mountain ash have sooner or later proved failures. Budded or grafted upon apple seedlings, pears sometimes make a feeble growth for a few years; but unless the grafts themselves throw out roots, by planting beneath the surface, they sooner or later perish. It sometimes happens that grafts of a few varieties inserted at standard height, grow and bear for a series of years. But experiments of this sort are not to be recommended, the few instances of success only forming exceptions to a general rule. The thorn has been extensively used in England, and to some extent in this country, with considerable success. But all other kinds of dissimilar stocks have given way to the *quince*, which is regarded as much superior for general use to any other. Of the different sorts of quince, the Orange quince has proved the best.

The varieties of the pear do not grow with equal facility upon the quince. A few, as the Duchesse d'Angouleme, Louise Bonne of Jersey, and Beurré Diel, are so much improved in quality that their cultivation on pear stocks is wholly discontinued by skilful fruit growers. A larger number flourish well, but are little changed in quality, as White Doyenné and Dearborn's Seedling. A few, on the other hand, succeed badly or wholly refuse to grow upon quince stocks, without *double working*, which consists in first budding some freely growing pear upon the quince bottom, and then budding or grafting the "refractory" sort into the pear shoot.

As a general rule, double-worked trees do not flourish for a great length of time. Single-worked have done well for 30 or 40 years under favorable influences.

The following list, made out chiefly from the combined experience of European and American cultivators, may prove valuable to those commencing with dwarf pears:

Pears succeeding best on the quince.

Louise Bonne of Jersey,
Beurré Diel,
Duchesse d'Angouleme,
Easter Beurré,
Beurré d'Amalis,
Vicar of Winkfield,
Long Green of Autumn,
Early Rousselet,
Stevens' Genesee,
Fortunée,
Glout Morceau,
Chaumontelle.

Pears usually succeeding well on both quince and pear.

Van Mons' Leon le Clerc,
Jaminette,
Belle Lucrative,
Harvard,
Queen of Low Countries,
Dearborn's Seedling,
Rostiezer,
Oswego Beurré.
Bartlett,
Napoleon,
Capiaumont,
White Doyenné,
Grey Doyenné,
Jargonelle,
St. Germain,
Beurré d'Aremberg,
Summer Franc Real,
Plombgastel,
Tyson,
Doyenné d'Eté,
Bon Chrétien Fondante,
Onondaga,
Osband's Summer,
Buffum,
Bloodgood,
Madeleine,
Compte de Lamy,
Duchesse d'Orleans,
Forelle,
Jersey Gratioli,
Passe Colmar,
Delices d'Hardenpont.

Pears succeeding on the quince only by double-working.

Beurré Bosc,
Marie Louise,
Gansel's Bergamot
Dix,
Flemish Beauty,
Knight's Monarch,
Suffolk Thorn,
Crassane, Winter and Althorpe,
Urbaniste,
Beurré Rance,
Ne Plus Meuris,
Thompson's,
Dunmore,
Hacon's Incomparable,
Winter Nelis and Seckel, in most instances, but sometimes succeeding.

The result is not always the same in different soils and in different seasons. The Seckel, for instance, has wholly failed in one year, and in another, on the same spot of ground, has grown well. The White Doyenné grew finely one summer, and almost totally failed the next. Some sorts which in nearly all cases do well, occasionally prove unsuccessful. A few, uniformly, in all seasons and in all soils, make a rapid and vigorous growth, of which the Louise Bonne of Jersey is perhaps the most striking example; some others, again, invariably fail, (unless double-worked,) the most prominent among which stands the Beurré Bosc. Indeed, so averse is this variety to a union with the quince, that it is by no means certain that it may not soon fail if worked in whatever manner. In some places, however, double-working has given it smooth and fair fruit where it has been cracked and blighted on the pear. Both this and the Flemish Beauty, as well as the Marie Louise, and some others, succeed well when grafted on the hawthorn.

The changes wrought by the quince stock, are often important and interesting. T. Rivers states that the Beurré d'Aremberg ripens several weeks earlier in winter; that the Easter Beurré is rendered more productive and matures its fruit, while on the pear it is a bad bearer, and does not ripen; that the Fortunée is a "perfect crab" upon the pear, but on the quince is melting and juicy; that the Glout Morceau is imperfect and ripens badly on the pear, but is always fair and attains a high and mature flavor on quince. As a general effect, the size of the fruit is increased, but in a few cases it is rendered more gritty in texture.

Unfavorable soils occasionally preclude the cultivation of some pears, but for the favorable influence of the stock.

Thus, at Dorchester, Mass., on Long Island, and in some other places, the White Doyenné only succeeds well upon the quince.

The stocks of dwarf pears should be wholly beneath the surface to avoid *the borer*, which avoids the pear.

Pruning Dwarf Pears. Dwarf pear trees are usually pruned into the *pyramidal* and *conical* form, the latter only differing in its broader shape. The annexed figure exhibits these forms distinctly. The principle to be adopted in pruning has been already explained on page 90; the extent to which it must be carried, should be such as to keep the trees within ten or twelve feet in height, and from four to six feet in diameter at the base. A greater height increases the difficulty of pruning. The same reason forbids the adoption of a head with a clean stem below, as in common standards.

Fig. 157.

The pyramidal mode of pruning may be applied to pear trees upon pear stocks, provided the luxuriance of growth is retarded by a triennial root-pruning. Without this, it would be difficult to prevent too great a growth of shoots, while the roots remained at their full extent and vigor, and sufficient fruitfulness would not be induced.

Dwarf trees may be planted at a distance of six to ten feet apart. They will always need careful attention to pruning, and to thorough and enriched cultivation of the ground.

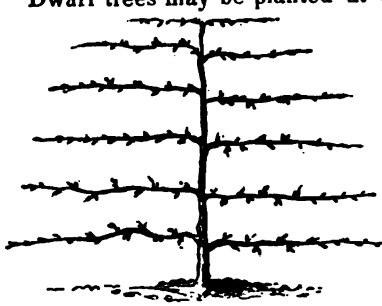


Fig. 158.

Horizontal training, for walls or espaliers, is very rarely practiced or needed in this country. It is occasionally employed in limited gardens, to form boundaries of walks, without occupying much lateral space, and where it is desired to

grow large and fine specimens of fruit by strong exposure to the sun. The mode may be briefly understood by the accompanying figure representing a partly grown tree. As the tree advances, shoots will be produced from the sides of the horizontal arms; these must be stopped or pinched off early in summer, to prevent their drawing too hard on the rest of the tree, and a similar course pursued with them to that described on page 90 of this work. The fruit-buds, and all the shoots or spurs supporting fruit-buds, are to be cut closely off wherever too thick for an even crop. Early in autumn the shortened shoots are to be cut down, leaving the fruit-buds, only, to bear the next season. By this regularity of pruning, the tree will preserve a neat appearance, and bear regular crops.

The horizontal branches may be about one foot apart for large pears, and eight inches for small; and the trees, if on quince roots, may be about 10 feet apart.

GATHERING AND KEEPING THE FRUIT.

Nearly all pears ripen with a much finer flavor if picked and matured in the house. The exceptions are very few. Some, which prove only second or third rate when allowed to remain till they soften on the tree, become rich, melting, and delicious if house-ripened. Gathering the fruit while yet hard, will in nearly all cases prevent or greatly diminish the *rotting at the core*, which otherwise nearly destroys the value of many early sorts.

Winter pears should hang upon the tree as late as safety will allow, and when gathered should be kept in a cool room till near their usual period of maturity, when the ripening is to be completed in a warm room, at a temperature of 60 or 70 degrees. They should be kept covered to prevent shrivelling. Some cultivators have wholly repudiated winter pears, merely from a want of skill in the management of their ripening, or the want of a good cellar to keep them in. Some sorts, however, as the Beurré d'Aremberg, require but little care; others, as the Vicar of Winkfield need particular attention. But the transfer from the cool to the warm room is of great importance to most, and will convert tough and hard specimens into those which are juicy, melting, and excellent.

DISEASES AND ENEMIES.

Blight. A most formidable difficulty in the cultivation of the pear, is the *blight*, known in its modifications, supposed or real, by the names *fire-blight*, *insect-blight*, frost-blight, and frozen sap-blight. The causes may be various, but the apearances are the same,—a sudden withering and turning black of the leaves on certain limbs during rapid growth, and while the rest of the tree remains apparently in full vigor, the evil extending downwards, unless naturally or artificially checked, till the whole tree is destroyed.

After a close investigation for years, by the most skilful cultivators of the country, a satisfactory explanation, applicable to all cases, has not been made.

The earlier theory was, that the hot rays of the sun produced the disaster, and hence the original name fire-blight. This was confirmed by the fact that the blight was often most fatal in the hottest summers; and weakened by the opposing fact that shaded portions of the tree were as frequently attacked as those fully exposed to the action of the hot sun.

It was subsequently discovered that a small insect, (*Scolytis pyri*,) by the supposed infusion of poison, caused the death of the branches, but no general or wide destruction of the pear could be traced to this source.

More recently, the *frozen-sap* theory has been extensively adopted. The explanation by this theory is as follows:—A damp and warm autumn causes a late and unripened growth of wood, imperfectly able to withstand the effects of winter. It is acted upon by severe frosts, not, however, so as to produce immediate death or winter-killing, but so as to result, sooner or later, in disease and partial decomposition of the sap, by which it becomes poisonous in its nature, and by passing downwards through the bark, spreads death in its progress.*

This theory is corroborated by many local observations, and by the general fact that the blight is much more de-

* A modification of the frozen-sap blight, known sometimes by the name of *frost-blight*, occurs early in summer, immediately after unusual and sharp nocturnal frosts. The young and tender shoots and the branches below them, are observed to die suddenly within a few days, but protracted in some instances to several weeks. The sap from the dead limbs does not in this case appear to be so deleterious as in other forms of blight, and although sometimes destroying large portions of trees, they more frequently escape after a partial loss of their tops

structive in the warm and fertile valleys of southern Ohio, where vegetation continues late, is more succulent in its texture, and where the frosts are sudden and sharp, than in the dryer and cooler climate of New England. But this same reason is also adduced in support of the original *fire-blight* theory, and indeed it applies with strength to both.

But after admitting that the different theories may be in part correct, and that the blight may be caused by a combination in a greater or less degree of each assigned cause, we are driven to the conclusion, from a large number of observations, of which these limits wholly preclude even a brief recital, that the cause of the blight, like that of the potato disease, remains hid in a large number of instances from our knowledge. And that, whether the latent tendency to disease is only increased and developed by changes of the weather, or whether those changes actually produce them, is yet enveloped in doubt.

Happily, however, *the remedy* is not obscured in uncertainty. For whether by an insect, or by the poisonous influence of the descending juices, its progress must be arrested by an immediate excision of the dead branches. And, as the poison passes downwards some time before its effects are visible externally, the amputation must be made two or three feet below the affected part, if the poison as well as the dead part, is to be removed. Equally necessary is it, that the infection of the diseased limbs be removed as speedily as possible out of the way, by burning.

This remedy cannot be effectual, unless very promptly and fearlessly applied. Many cultivators, in fear of mutilating their trees, do not cut low enough, and leave the seeds of death remaining in the tree. Others delay the application of the remedy for a number of days, till cure is hopeless. In extensive and malignant cases, the disaster may be difficult to subdue even by the most prompt measures; but in ordinary instances entire success will follow. In any event, it will be better to cut away and burn by successive portions a whole tree, than to lose it entire by this disease, a result equally certain, with the added evil of spreading the malady.

Two contiguous neighbors had each a large pear orchard; one of them neglected all attention, the other spent ten

minutes daily in the examination of all his trees, and in cutting out freshly diseased limbs. The former lost many entire trees; the latter saved every one, and kept his orchard nearly clear.

Young trees in close rows have been attacked successively till all perished; in other rows where the affected trees were quickly removed, few of the remainder suffered.

Washing the affected parts with a solution of potash and sulphate of iron, (or copperas,) has in some cases arrested the disease, or destroyed the peculiar fermented odor which attends its more malignant forms, and by which, perhaps, it is sometimes spread.

Among preventives, a good, rich, firm, and dry soil, and a site favoring the early ripening of the wood, and adverse to a late succulent growth, hold an important rank. The bark of the pear is evidently of a very delicate structure, and it becomes more able to resist changes and disease as the growth is moderately vigorous, and healthy and matured.

The attempt has been made to select those varieties least liable to blight, but results vary so exceedingly, that nearly all efforts have proved fruitless. But among those which have escaped in the largest number of instances may be named, first, the Seckel, which is scarcely ever destroyed even at Cincinnati, and the White Doyenné. The Madeleine and Passe Colmar appear to be more liable than the majority of sorts.

Dwarf pear trees are not usually so subject to blight as others.

Cracking of the fruit has been already adverted to under the head of soils and special manures, and the remedy pointed out. It usually appears in the form of a thick coating of black rust, spreading over the surface, when partly grown, causing the skin to crack, shrivel, and dry up.

SYNOPSIS OF ARRANGEMENT.

DIVISION I. SUMMER PEARS.

Class I. Distinct pyriform.

Section I. Large pears.
Section II. Medium in size.
Section III. Small.

Class II. Obscure pyriform, obovate, or turbinate.

Section I. Large pears.
Section II. Medium in size.
Section III. Small.

Class III. Roundish or oblate.

Section I. Large pears.
Section II. Medium in size.
Section III. Small.

DIVISION II. AUTUMN PEARS.

Class I. Distinct pyriform.

Section I. Large pears.
Section II. Medium in size.
Section III. Small.

Class II. Obscure pyriform, obovate, or turbinate.

Section I. Large pears.
Section II. Medium in size.
Section III. Small.

Class III. Roundish or oblate.

Section I. Large pears.
Section II. Medium in size.
Section III. Small.

DIVISION III. WINTER PEARS.

Class I. Distinct pyriform.

Section I. Large pears.
Section II. Medium in size.
Section III. Small.

Class II. Obscure pyriform, obovate, or turbinate.

Section I. Large pears.
Section II. Medium in size.
Section III. Small.

Class III. Roundish or oblate.

Section I. Large pears.
Section II. Medium in size.
Section III. Small.

VARIETIES.

The quality of pears is remarkably liable to change from external causes. A difference in soil and cultivation exerts so great an influence with many fine sorts, that while they possess the highest flavor when growing on favorable ground kept rich and mellow, they become greatly inferior or even worthless in poor soil with neglected culture. Besides these, there are other influences dependant on a change of locality, all of which taken together, have contributed to the great diversity of opinion which exists in relation to many celebrated varieties. The experienced pomologist will hence perceive the difficulty of weighing evidence for and against the different sorts, and of expressing a degree of quality that shall coincide with the opinions of all.

It will be understood, that the quality given on the following pages, refers only to pears tested in this country. Some European varieties, which maintain a high character at home, prove of no value here.

In describing pears, it may be well to repeat that the term *base* applies in all cases to the part nearest the tree; and *apex*, to the part most remote. This is in accordance with universal practice among eminent botanists. The apex is usually termed the *crown;* and it is sufficiently evident that the crown (upper portion or surmounting part,) cannot at the same time be the base.

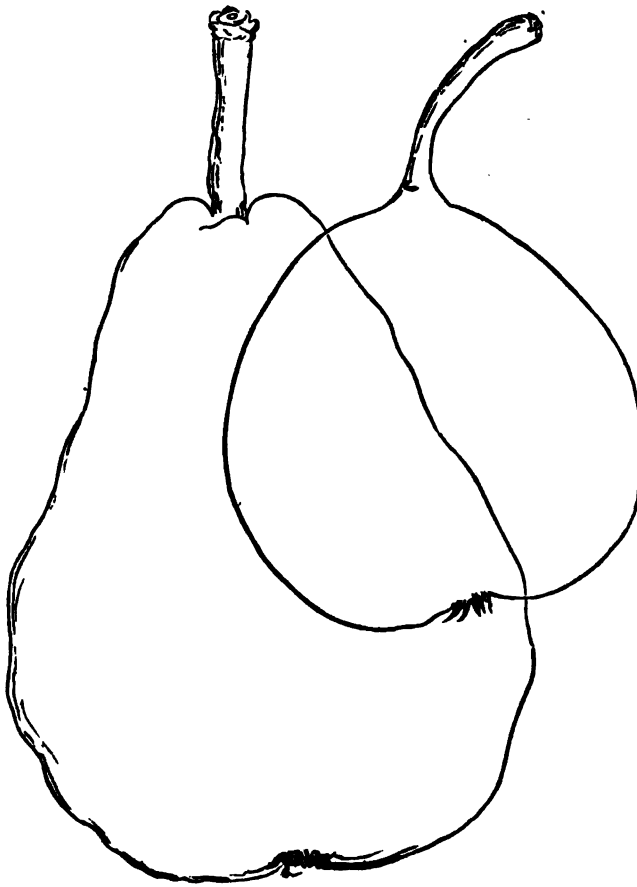


Fig. 154—*Bartlett.* Fig. 155—*Bloodgood.*

DIVISION I.—SUMMER PEARS.

CLASS I.—DISTINCT PYRIFORM.

Section I.—Large Pears.

BARTLETT. (*Syn.* Williams' Bonchretien.) Quite large obtuse-pyriform, slightly obconic, surface wavy, clear yellow, sometimes a faint blush; stalk an inch and a fourth long, stout, slightly sunk; basin little or none; apex slightly plaited, sometimes smooth; flesh nearly white, very fine-grained, exceedingly tender and buttery, with a nearly sweet, sometimes faintly sub-acid, perfumed, fine, moderately rich flavor. Ripens end of summer and beginning of autumn; and far north, is strictly an autumn pear. The fruit, when not fully grown, ripens and becomes of good quality if kept in the house a week or two. Growth erect, vigorous, leaves folded, slightly recurved; shoots yellowish. Tree very productive, and bears very young. Although not of the first class as to flavor, the many fine qualities of this pear render it a general favorite.

Belle of Brussels. (*Syn.* Belle de Bruxelles, Beauty of Brussels, Belle d'Aout, Belle of August.) Rather large, sometimes only medium, neck rather long, slender, and somewhat obconic; surface smooth, rich yellow with greenish specks, slightly reddened in the sun; stalk an inch and a half long, rather stout, fleshy at ends; calyx scarcely sunk; flesh white, with a third-rate flavor. Very handsome, but worthless. Late summer. Belgian.

Jargonelle, (English.) (*Syn.* Epargne, Real Jargonelle.) Rather large, long pyriform, neck rather slender, acute, body nearly round, or slightly ovate in large specimens; surface greenish yellow, with a dull brownish cheek; stalk an inch and three-fourths long, curved, obliquely inserted; calyx large, rather erect, basin very small; flesh rather coarse, juicy, with a pleasant, refreshing sub-acid,

second-rate flavor. Ripens about two weeks after harvest, and three weeks or more before the Bartlett. Shoots large, dark brown, becoming rather crooked. The fruit rots badly at the core unless ripened in the house. Of French origin.

French Jargonelle. (*Syn.* Bellisime d'Eté, Supreme, Summer Beauty, Red Muscadel.) Size, medium; pyriform, approaching obovate; skin shining, light green, becoming lemon yellow, with a rich, deep red cheek; stalk an inch and a fourth long, slightly sunk; basin shallow; flesh white, coarse, breaking, sweet, flavor third rate. Rots at the core. Ripens with the English Jargonelle. Growth strong, upright. Handsome and worthless.

Windsor. (*Syn.* Summer Bell.) Large, very distinct pyriform, body somewhat ovate or conical; skin green or greenish yellow, sometimes a dull brownish cheek; stalk nearly two inches long, fleshy at insertion, not sunk; calyx erect or closed, sunk little or none; flesh rather coarse, slightly acid and astringent, of poor flavor. Rots at the core. Ripens middle of 8 mo., (Aug.) Valueless, but has been cultivated on account of its size and beauty, and the free growth and productiveness of the tree.

Section II.—Medium in size.

Brandywine. Size medium; obconic-pyriform, neck acute; smooth, dull yellowish green, partly russeted, crown thickly russeted; stalk three-fourths to an inch and a half long, fleshy at insertion; flesh white, very juicy and melting, of fine flavor. Leaves rather small, shoots pale olive, vigorous, upright; tree very productive. A native of Delaware Co., Pa. New.

Summer Thorn. (*Syn.* Epine d'Eté.) Size medium; pyriform, approaching obconic-turbinate; surface smooth, greenish yellow, a little darker and sometimes reddened towards the sun; stalk stout, an inch to an inch and a fourth long, not sunk, fleshy at insertion; calyx short, basin plaited, very shallow; flesh tender, melting, with a third rate flavor. Resembles a small Jargonelle. Shoots yellowish brown.

TYSON. Size medium, often rather large, obconic-pyriform, sometimes approaching obconic-obovate; bright yellow, with a reddish brown softly shaded cheek, often some russet; stalk an inch and a fourth long, inserted into a fleshy prominence abruptly contracted from the rounded neck; basin very shallow, even; flesh of fine texture, buttery, very melting, juicy; flavor nearly sweet, aromatic, slightly perfumed, excellent. Ripens the last two weeks of summer. Shoots quite dark brown, erect, vigorous. The tree does not come soon into bearing. A native of Pa.

Winship's Seedling. Size medium, obconic-pyriform; pale lemon yellow, faintly russeted; stalk an inch and a half long, slender, curved, not sunk; calyx closed, basin round; juicy, melting, pleasant, second-rate. Late summer. Shoots yellowish. Boston, Mass.

Section III.—Small.

Early Rousselet. (*Syn.* Rousselet Hatif, Early Catherine, Cyprus Pear, Kattern.) Rather small; neck narrow, acute; stalk an inch to an inch and a half long, fleshy at insertion; surface yellow, with a reddish brown cheek; calyx small, basin shallow; flesh sweet, pleasant, perfumed. Ripens with the Jargonelle, and immediately after the Madeleine. A second-rate fruit.

Skinless. (*Syn.* Sanspeau.) Rather small, long pyriform, body conic-ovate, regular; skin smooth, very thin, yellowish green, often dotted with reddish brown in the sun; stalk about an inch and a half long, slender, curved, cavity very small; calyx closed or erect, basin minute, slightly ridged; flesh half melting, juicy, with a sweet, slightly perfumed, good second-rate flavor. Ripens immediately after the Madeleine, or two weeks after harvest. Growth very vigorous, erect, leaves flat, wavy. A profuse bearer; fruit always fair. Valuable.

The Summer Frankreal, Madeleine, and Julienne, of the next class, slightly approach this class in form.

CLASS II.—OBSCURE PYRIFORM, OBOVATE OR TURBINATE.

Section I.—Large Pears.

Leech's Kingsessing. Rather large; obovate, approaching obtuse-pyriform; green, with darker patches; stalk an inch long, sunk little or none on the obtuse base; calyx small, basin shallow; flesh buttery, delicate, rich. End of summer. Tree slightly thorny, shoots upright, vigorous, greenish yellow. Origin, Philadelphia.

Smith's Moyamensing. Medium or large, sometimes quite large, variable; round-obovate, rather irregular; skin lemon yellow, sometimes marked with russet; stalk nearly an inch long, fleshy; basin furrowed; flesh buttery, melting, good, but not first-rate. Ripens from midsummer till autumn. Productive. Origin, Philadelphia. Dr. Brincklé observes, that this pear, like many others of its season, must be eaten by the chronometer, and if taken exactly at the right period, is of first quality.

Section II.—Medium in size.

BLOODGOOD. Size medium; turbinate, approaching obovate, base contracted abruptly to the stalk; yellow, touched with russet; stalk fleshy at insertion, an inch and a fourth long, set on the rounded base without depression; calyx scarcely sunk; flesh yellowish white, buttery and melting, with a fine rich, aromatic flavor. Sometimes rots at the core. On some soils, the flavor becomes poor and insipid. Ripens immediately after Jargonelle and Skinless, or the first half of 8 mo., (Aug.) Like all early pears, it is best if house-ripened.

Crawford. Size, medium; obovate; light yellow, with a brown cheek; flesh white, buttery, sweet, with a third-rate flavor. Late summer. Scotch.

Julienne. Size, medium; obovate, sometimes slightly pyriform, regular; whole surface clear yellow; stalk an inch long, rather stout, cavity small; calyx small, erect or closed, basin rather shallow; flesh half buttery, sweet, of

good second-rate flavor, but often poor on heavy soils. Late summer. Shoots yellowish. Productive, and bears when very young.

Limon. Size medium; obovate, slightly pyriform; light yellow, with a reddish brown blush; stalk an inch and a half long; cavity round, even, shallow; calyx slightly sunk; flesh buttery, melting, of fine texture, with a mild, sweet, slightly perfumed flavor. Late summer. Shoots long, slender, reddish brown. Belgian.

MADELEINE. (*Syn.* Citron des Carmes, Magdelen, Green Chisel, *incorrectly.*) Medium in size, obconic-obovate, obcurely pyriform; skin smooth, pale yellowish green, rarely a faint brownish blush; stalk slender, an inch and a half long, cavity very narrow and small; basin very shallow; flesh very juicy and melting, usually faintly acid, with an agreeable, delicate, fine, refreshing flavor. Matures about midsummer, or at the time of wheat harvest. Needs house-ripening. Shoots straight, erect, greenish, growth vigorous; tree rather liable to blight. Leaves quite flat.

Muscadine. Size medium; short obovate, regular, sometimes slightly oblique; surface a little rough, yellowish green, thickly dotted; stalk an inch and a fourth long, rather stout, cavity very small, even; basin rather wide, shallow; flesh buttery, melting, a little coarse, rather rich, slightly musky, faintly astringent, good second or nearly first-rate. Ripens end of summer, and early in autumn. Shoots rather thick. Origin, Orange County, New-York.

Osband's Summer. (*Syn.* Summer Virgalieu, *erroneously.*) Medium in size, often rather small, obovate, regular, smooth and even; sometimes remotely pyriform; greenish yellow becoming yellow, with a reddish brown cheek, often faintly russeted; stalk three-fourths to one inch long, slightly sunk in a nearly even cavity; calyx erect, in a round, nearly even, or slightly wrinkled basin; flesh white, granular, with a sweet, mild, and fine flavor. First rate in its best state, but soon loses its flavor when ma-

Fig. 159—*Summer Frankreal.*

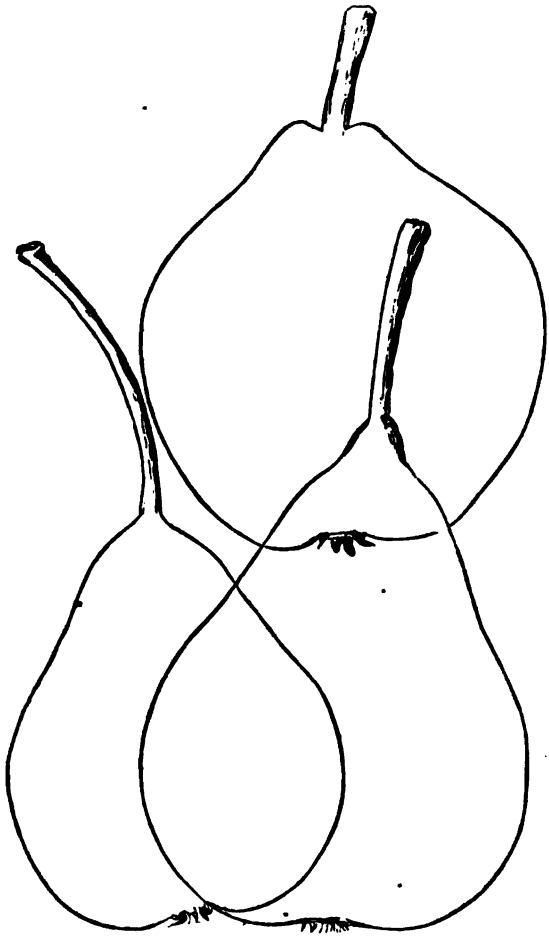


Fig. 160—*Rostiezer.* Fig. 161—*Tyson.*

ture. Ripens early in 8 mo. (Aug.) Shoots yellowish olive, thick. Origin, Wayne Co., N. Y.

ROSTIEZER. Rather small, sometimes medium in size; obconic-pyriform, approaching obovate, regular; skin dull brownish green, with a dark, dull, reddish brown cheek to the sun, with whitish specks, and traces of thin russet; stalk an inch and a half to two inches long, slender, scarcely sunk; basin little or none; flesh juicy, melting, sweet, with a very high, perfumed flavor, of high excellence. Ripens late in summer. For rich flavor, it has scarcely an equal among summer pears. Shoots dark.

Sugar of Hoyersworda. (*Syn.* Sucre de Hoyerswerda.) Size, medium; obovate, approaching short pyriform; smooth, pale yellowish green; stalk an inch and a fourth long, scarcely sunk; basin small; flesh white, juicy, sweet, second-rate. End of summer. Needs house-ripening. Profusely productive. Shoots long, olive brown, leaves narrow.

Sugar Top. (*Syn.* July Pear, Prince's Sugar.) Size medium, roundish-obconic, turbinate, regular; skin yellow, with light green specks, rarely a very faint brownish blush; stalk stout, fleshy at insertion, an inch and a half long; basin small; flesh sweet, tender, rather breaking, becoming mealy, third rate in flavor. Very productive. Ripens about midsummer, a few days after the Madeleine.

SUMMER FRANKREAL. (*Syn.* Franc Réal d'Eté.) Size medium, short-obovate, slightly pyriform, with a very short obtuse neck, body slightly conical, or tapering to the crown; green, becoming pale yellowish green, often a faint yellowish brown blush; stalk three-fourths of an inch long, thick, slightly sunk; calyx closed, basin furrowed; flesh white, fine-grained, buttery, melting, rich, excellent. Late summer and early autumn. Shoots and leaves rather downy, leaves large.

Summer St. Germain. Medium size, obovate; pale green; stalk an inch and a quarter long, oblique; basin very shallow or none; flesh tender, juicy, sweet, faintly acid, second-rate.

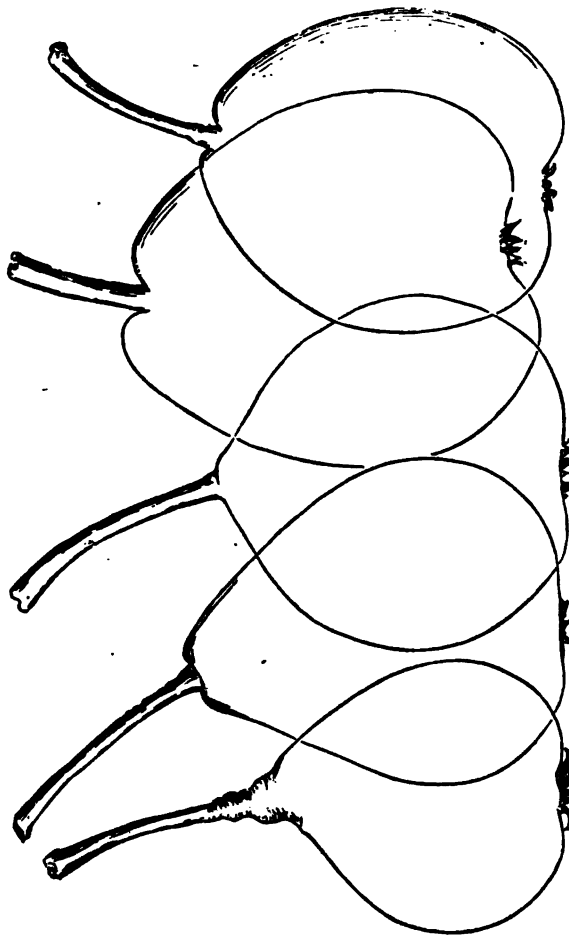


Fig. 162—*Amire Jouanet.* 163—*Madaisse.* 164—*Summer Doyenne.* 165—*Osband's Summer.* 166—*Dearborn's Seedling.*

Vallée Franche. Size medium, obovate or turbinate, acute; pale green, becoming pale yellowish green; stalk an inch long, not sunk; basin shallow; flesh white, rather coarse, juicy, with a simply sweet, third-rate flavor. End of summer. Valueless.

Tyson pear, of the preceding class, often approaches this in outline.

Section III.—Small.

Amiré Joannet. (*Syn.* Early Sugar, St. John's pear, Joanette.) Small; roundish obovate or turbinate, with a very small and short neck; light green becoming yellow, usually with a reddish brown cheek, and with conspicuous red dots; stalk an inch and a quarter long, fleshy at insertion; calyx large, not sunk; pleasant and moderately juicy, becoming dry, and with a sweet, second or third rate flavor. Ripens about a week before wheat harvest, and is the earliest pear known, which comprises its merit. Growth stout, upright, vigorous, leaves flat, tree very productive, bearing when young.

Dearborn's Seedling. Scarcely medium in size, obovate turbinate, regular, smooth; surface clear yellow, with minute specks; stalk an inch long, sunk little or none, basin very shallow; flesh very fine grained, juicy, melting, and of fine flavor. Ripens nearly with the Bloodgood, or middle of 8 mo., (Aug.) Shoots straight, long, dark brown. Tree bears when young; the fruit always fair and of first quality in nearly all localities.

Edward's Henrietta. Size, a little below medium; obovate, crown flattened; stalk set on the rounded point of the neck; skin smooth, pale yellowish green, dots few; stalk an inch and a half long, cavity small or none; calyx closed, basin shallow, faintly plaited, melting, juicy, subacid, with a good second-rate flavor. Very productive. Late summer. Origin, New Haven, Conn.

Green Chisel. Small, nearly round, color green; stalk three-fourths of an inch long, scarcely sunk; calyx rather large, crumpled; flesh juicy, slightly gritty, sweet, of second or third-rate flavor. Late summer. Shoots erect.

Hessel. (*Syn.* Hazel.) Rather small, obovate, yellowish green, thickly dotted; stalk one inch long, oblique; calyx small; basin shallow; flesh whitish, juicy, pleasant. Late summer and early autumn. Shoots spreading.

Little Musk. (*Syn.* Petit Muscat, Little Muscat, Primitive.) Quite small, turbinate; dull greenish yellow; stalk three-fourths to an inch and a half long, little sunk; calyx open, basin little or none; flesh breaking, sweet, very slightly musky, second-rate. Rather better in quality than Amiré Joannet, but smaller and a week later, ripening with the Madeleine. Very productive.

Manning's Elizabeth. Small, obovate, obscurely pyriform, smooth; surface yellow, with a lively blush; stalk one inch long, cavity round, shallow; flesh very melting, saccharine, sprightly, perfumed. End of summer. Belgian.

Muscat Robert. (*Syn.* Musk Robine, Early Queen, D'Ambre.) Small, turbinate, greenish yellow; stalk three-fourths of an inch long, surface at insertion uneven, but not sunk; calyx large, basin little or none; flesh tender, juicy, pleasant. Ripens with the Madeleine.

Ott. Small, roundish, turbinate; greenish yellow, russeted in part, rarely a mottled red cheek; stalk an inch and a fourth long, cavity small; calyx rather large, basin shallow; flesh melting, rich, perfumed, aromatic, closely resembling that of its parent the Seckel. Ripens quite early, or by the first or middle of 8 mo. (Aug.) Origin, Montgomery Co., Pa. New.

Summer Doyenne. (*Syn.* Doyenné d'Et[illegible].) Small; round-obovate, slightly turbinate; stalk an inch or an inch and a fourth long, rather stout, slightly oblique, not sunk; basin very shallow; skin a fine yellow, with a warm cheek brightly reddened at the crown; and with radiating stripes of greenish yellow from the calyx; flesh melting, juicy, sweet, with a pleasant but not high flavor. Skin thin; core small; seeds small, white. Ripens with the Madeleine, and nearly equal to it in quality. Tree bears very young. Shoots slender, reddish brown. New.

Class III.—Roundish or oblate.

Section I.—Large Pears.

Hampden's Bergamot. (*Syn.* Summer Bergamot, *Lind.;* Bergamote d'Eté, Scotch Bergamot.) Large, roundish, slightly obovate; green becoming clear yellow, dots small; stalk one-half or three-fourths of an inch long, rather stout; cavity small, round; calyx small, closed, basin shallow; flesh breaking, granular, half buttery and agreeable if house-ripened. End of summer and first of autumn. Handsome. Growth strong.

Section II.—Medium in size.

Bergamot, Early. Size medium, roundish-oblate; pale yellowish-green, a few dull red streaks towards the sun or a faint dull red cheek; stalk an inch and a quarter long, thick, slightly sunk, juicy, sweet, crisp, third-rate. Late in summer. French.

Bergamot, Large Summer. Medium in size, roundish, approaching obovate, smooth, clear yellow; stalk an inch and a half long, cavity and basin narrow, deep, and smooth; flesh breaking, half buttery, not rich. Early in autumn. Tree of free growth and productive.

Citron. Size, medium; roundish; dull green; flesh greenish white, a little coarse, melting, juicy, good. End of summer. Origin, New-Haven, Conn.

Fine Gold of Summer. (*Syn.* Fin Or d'Eté.) Round-turbinate, skin very smooth, yellowish green, with a brilliant red cheek; stalk three-fourths of an inch long, not sunk; basin very shallow; flesh greenish white, juicy, half-breaking, second-rate. Ripens soon after the Madeleine.

Summer Rose. (*Syn.* Epine Rose, Thorny Rose, Poire de Rose.) Medium size, roundish-oblate; skin faint yellow, with some russet, and a red russet cheek; stalk an inch and a quarter long, slender, cavity very small; basin very shallow; flesh juicy, rather rich, good second-rate End of summer. Soon decays.

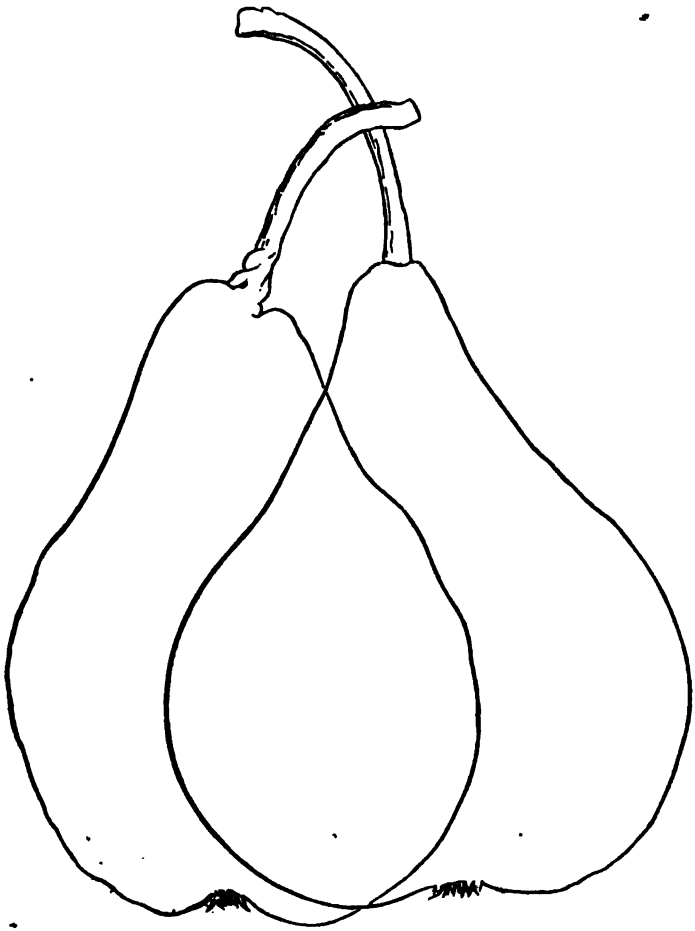


Fig. 167—*Paradise d'Automne.* Fig. 168—*Beurre Bosc.*

Section III.—Small.

Bergamot, Summer. Small, round, yellowish green, with a brownish cheek; basin wide; flesh juicy, moderately rich, soon becoming mealy and dry. Ripens soon after mid-summer. Growth feeble.

Summer Portugal. (*Syn.* Passans du Portugal.) Size, rather small, often nearly medium; roundish-oblate, regular; skin yellowish green or pale yellow, with a handsome red cheek in the sun, formed of the reddened dots; stalk about an inch long; calyx stiff, erect; cavity and basin shallow; flesh white, breaking, tender, juicy, good second-rate. Late summer. Very productive. Shoots upright, reddish brown.

Williams' Early. Rather small, roundish, remotely turbinate, regular; bright yellow, sunny side with scarlet dots; stalk an inch and a half long, fleshy at insertion; calyx very short, erect, basin slightly plaited; flesh white, granular, juicy half-buttery, rich, slightly musky. End of summer and first of autumn. Shoots dark. A handsome, good second-rate pear, a native of Roxbury, Mass.

Summer Doyenné, of the preceding class, approaches this class in form.

DIVISION II.—AUTUMN PEARS.

Class I.—Distinct pyriform

Section I.—Large Pears.

BEURRE BOSC. (*Syn.* Calebasse Bosc.) Large, very distinct pyriform, neck rather long and very narrow, acute; body large oblate; surface nearly smooth, deep yellow, russeted in patches; stalk an inch and a half long, slender, curved; basin very shallow; flesh juicy, buttery, rich, perceptibly perfumed, sweet, excellent. Mid-autumn. Growth moderate, a regular, even bearer. Fails entirely on quince stocks. Belgian.

Beurre Diel. (*Syn.* Diel, Diel's Butter.) Large, sometimes very large, thick pyriform, neck short, obtuse, body very large; small specimens approach obovate; skin dull yellow, with numerous conspicuous dots, and some russet; stalk an inch and a fourth to an inch and a half long, stout, moderately sunk; basin slightly furrowed; flesh rather coarse, rich, sugary, buttery, juicy, fine. Late autumn and early winter. Leaves roundish or broad. Uniformly fine on quince stocks, second-rate on the pear. Belgian.

Bishop's Thumb. Rather large, long and narrow, distinct pyriform, surface very uneven; skin dark yellowish green, more or less russeted; a dull red russet cheek; stalk an inch and a half long, crooked; basin very shallow, calyx erect or reflexed; flesh juicy, melting, good. Ripens mid-autumn. English.

Burnett. Large, obtuse pyriform; smooth, pale yellow, thickly dotted, sometimes slightly russeted; stalk an inch and a half long; calyx stiff, basin shallow; flesh greenish white, rather coarse, juicy, second-rate. Mid-autumn. Origin, Southborough, Mass.

Chelmsford. Large, obconic-pyriform, obscurely ribbed at crown, yellow, with a red cheek, showy; stalk an inch and a half long, cavity crumpled, shallow; calyx deep-sunk; flesh hard, breaking, sweet; only fit for cooking. Mass.

Colmar d'Aremberg. Large, short obconic-pyriform, neck short and narrow, body large and somewhat ribbed; yellow, mottled with russet; stalk oblique; basin very deep; flesh fine-grained, melting, buttery, but with a poor third or fourth-rate flavor. This new foreign sort has been highly praised, but several years of fruiting in this country have proved it worthless.

Cumberland. Large, obovate-pyriform, or obconic-pyriform, orange yellow, with a pale blush, showy; stalk an inch and a half long, stout; calyx slightly sunk; flesh white, melting, buttery, with a poor third-rate flavor. Mid-autumn. Origin, Cumberland, R. I.

Dix. Large, long pyriform, body round-ovate, tapering slightly to the often oblique and slightly flattened and obtuse crown; yellowish green, becoming deep yellow; dots numerous, distinct; stalk an inch and a quarter long, stout at each end, slightly sunk, basin small; flesh rather granular, rich, juicy, sweet, often excellent, sometimes rather acid. One of the most valuable autumn pears. Middle and late autumn. A tardy bearer. Shoots yellow, rather slender, often thorny; leaves flat. A native of Boston, Mass.

Duchesse d'Angoulême. Very large, very obtuse pyriform, sometimes oblong-obovate, surface very uneven, greenish yellow, often some russet; stalk an inch to an inch and a half long, very stout, cavity deep, often wide; calyx small, basin uneven; flesh yellowish white, rather coarse, melting, buttery, juicy, sometimes fine, often poor—usually nearly first-rate, or good second-rate, on quince stocks; worthless on pear stocks. Ripens mid-autumn, and later. French.

Duchesse d'Orleans. Large, often only medium; sometimes long-pyriform, but usually obovate-pyriform, somewhat obconic; skin golden yellow, slightly russeted, sometimes nearly overspread with russet, with a red cheek; stalk thick, about an inch and a half long, scarcely sunk; basin small, even; flesh buttery and melting, rich; when well ripened, delicious. Ripens mid-autumn. A very handsome, fine, new, French variety. Growth rather spreading, shoots yellowish.

Frederick of Wurtemburg. (*Syn.* Frédéric de Wurtemburg.) Large, short pyriform, neck narrow, very acute, crown broad, body oblate; surface whitish yellow, rarely deep yellow, often a handsome red cheek, more or less russeted; stalk an inch to an inch and a half long, sometimes very fleshy, often not; basin wide, very shallow; flesh, when well ripened, very melting, buttery, juicy, sometimes delicious, often poor,—varying from first to below third-rate. Needs house-ripening. Early and mid-autumn. Shoots yellowish brown, thick. Belgian.

Gendesheim. Large, often only medium, obtuse-pyriform, rather irregular, small specimens obovate, approaching

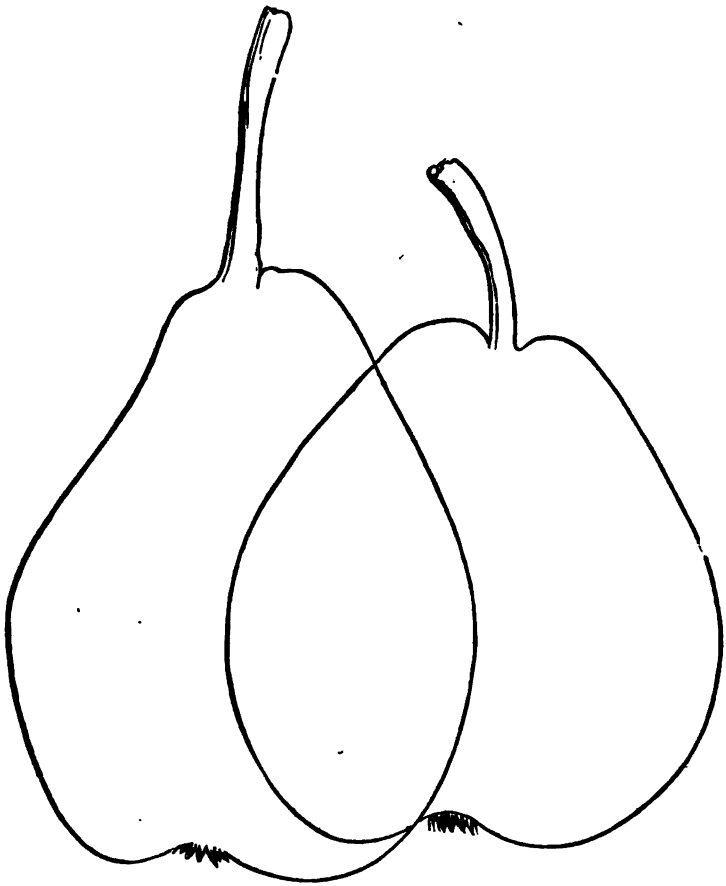


Fig. 169—*Louise Bonne of Jersey.* Fig. 170—*Flemish Beauty*

obtuse-obconic; skin greenish yellow, thickly dotted, slightly russeted; stalk an inch or more long, oblique; calyx small, basin narrow, irregular; buttery, rather rich, gritty at core, second rate. Late autumn. Flemish.

King Edward's. (*Syn.* Jackman's Melting.) Large or medium, neck acute, obconic; surface rough, greenish yellow, with a dull reddish cheek; and some patches of greenish russet; stalk half an inch to an inch long; calyx small, erect, scarcely sunk; flesh buttery, melting, sometimes good, often rather acid and astringent. Handsome, second-rate. Mid-autumn.

Long Green. (*Syn.* Long Green of Autumn, Verte Longue, Mouthwater.) Rather large, long-pyriform, neck long, narrow, rather acute, body ovate-conical, or tapering to the crown; surface uniformly green; stalk an inch or little more long, often oblique, not sunk; calyx scarcely sunk, often prominent, reflexed; flesh very juicy, with a high, nearly first-rate or good second-rate flavor.

The Verte Longue Panaché, or Striped Long Green, is a worthless sub-variety of the above, with striped skin.

LOUISE BONNE OF JERSEY. (*Syn.* Louise Bonne de Jersey, Louise Bonne d'Avranches.) Large pyriform, neck somewhat obconic, body approaching oblong, tapering slightly to obtuse or flattened crown; slightly one-sided; surface smooth, pale yellowish green, with a brownish red cheek; stalk an inch to an inch and a half long, often fleshy at insertion, little sunk; basin shallow; flesh yellowish white, very juicy, buttery, melting, rich, faintly sub-acid, fine. Ripens mid-autumn; late autumn far north, early autumn at Cincinnati. Very productive; succeeds admirably and grows with great vigor on quince stocks, and should be worked on no other. Shoots dark brown or purple; serratures of the leaves rather coarse. This fine variety, like the Bartlett, is hardly of the highest quality, but is eminently valuable for its large, fair fruit, free growth, and great productiveness.

Madotte. Large, pyriform, smooth, yellow, with a little russet; stalk one inch long, thick at ends, not sunk; flesh

half-buttery, dry, third-rate or worthless. Showy. Mid-autumn.

Marie Louise. Large pyriform, a little one-sided, or with a curved axis; body somewhat conical; surface pale green, becoming yellowish, partly russeted; stalk an inch and a half long, rather stout, often oblique; calyx small, basin narrow, plaited; flesh buttery, melting, vinous, when well grown rich and fine,—often second or third rate,—variable. Needs rich cultivation or else the fruit will be poor. Mid-autumn. Growth very flexuous and straggling, shoots olive gray, petioles very long, leaves narrow. Belgian.

Marie Louise Nova. Rather large; regular pyriform, neck acute, tapering; skin smooth, yellow, with a brownish red cheek; stalk one to two inches long, rather slender; basin shallow; melting, juicy, quickly decays, sometimes good, often poor. Early mid-autumn. Belgian.

Neill. Large, obovate-pyriform, axis slightly curved, neck acute, stalk an inch long; skin pale yellow, with traces of thin russet; flesh white, buttery sweet. Shoots diverging. Belgian.

Onondaga or Swan's Orange. Quite large, obtuse oval-pyriform, nearly in the form of a double cone, neck very short and obtuse, body large and tapering to obtuse apex; skin roughish, greenish yellow, becoming rich yellow, dots numerous, often a slight brown cheek, crown often slightly russeted; stalk an inch to an inch and a half long, stout, slightly sunk; calyx small, closed, basin narrow, ribbed; flesh slightly coarse, buttery, melting, sometimes a little breaking, juicy, rich, high-flavored, fine, but not of the highest quality. Ripens mid-autumn. Growth vigorous, shoots yellow, ascending. Productive. Origin unknown; cultivated in western New-York. Nearly resembles the Ronville in outline.

PARADISE D'AUTOMNE, or "Autumn Paradise."—Rather large, distinct pyriform; surface uneven, yellowish orange, with some thin russet patches; stalk an inch and a half long, not sunk; basin small, irregular; flesh melt-

ing, very buttery, with a rich, high, and excellent flavor. Ripens about mid-autumn. Shoots yellowish, at first upright, afterwards becoming straggling, growth vigorous. This pear resembles the Beurré Bosc, but is less smooth, more irregular in form, has a less narrow neck, is more melting and sprightly, and of more vigorous growth.

Plumbgastel. Large, pyriform, slightly obconic, crown obtuse; surface smooth, greenish yellow, crown russeted with a distinct boundary; stalk an inch long, stout, not sunk; basin moderate, narrow; flesh rather coarse, half-melting, juicy, rich, with a good second-rate flavor, about equal in richness to the Bartlett. Middle and late autumn. French. New.

Queen of the Low Countries. Large pyriform, neck narrow, body broad or slightly oblate; surface slightly uneven, dull greenish yellow, crown russeted, with numerous, often confluent russet dots, and a slight blush; stalk an inch and a half long, curved, not sunk; calyx small, rather deep-set, basin ribbed; buttery, melting, juicy, moderately rich, sub-acid, with a second-rate, Brown Beurré flavor. Mid-autumn. Belgian.

Reine des Poires. Rather large, obtuse-pyriform, varying to turbinate, regular; greenish-yellow; stalk an inch and one-fourth long, slender; basin shallow; flesh dry, flavor poor. Mid-autumn.

Summer Bonchretien. (*Syn.* Bon Chretien d'Eté, Summer Good Christian, Gratioli d'Eté, September.) Large, pyriform, somewhat obtusely and irregularly ribbed; skin yellow, with a rich orange red cheek to the sun; stalk two inches long curved, sunk or not; calyx small, in an uneven basin; flesh granular, breaking, juicy, very sweet, pleasant. Fine for baking. Liable to crack and mildew in many localities; when fair and well grown it is of fine quality. Ripens early in autumn. Growth straggling, shoots stout, horny, buds projecting, hard; leaves roundish, flat.

Triomphe de Jodigne. Quite large, pyriform; stalk short, thick; calyx sunk; skin deep yellow, slightly green in

the shade, deep red in the sun; flesh melting, of good flavor. Ripens late autumn. Tree vigorous. New.

URBANISTE. (*Syn.* Beurré Piquery.) Rather large, obconic-pyriform, obtuse and short, often approaching obovate; skin pale yellow or greenish, faintly russeted; stalk an inch long, stout, moderately and sometimes considerably sunk; calyx erect or closed; basin distinct, even; flesh melting, buttery, with a fine, delicious perfumed flavor, and a perceptible shade of acid. In unfavorable localities, it is sometimes hardly first-rate. Middle and late autumn. Does not come soon into bearing. Flemish.

VAN MONS LEON LE CLERC. Large, long pyriform, or rather oblong-obconic pyriform, obtuse; surface yellowish green, slightly russeted; stalk an inch and a fourth long, stout, little sunk; calyx small, basin very shallow; flesh fine-grained, yellowish white, buttery, melting, rich, fine. Ripens middle and late autumn. A native of Laval, in France. The value of this fine new pear is diminished by its liability to crack and canker.

Section II.—Medium in size.

Amande Double. Size medium, pyriform; skin yellow and bright red; stalk short, fleshy at insertion; flesh coarse, sweet, tender, second or third-rate, rarely good. Early autumn. Belgian.

ANDREWS. (*Syn.* Amory, Gibson.) Medium or rather large, distinct pyriform, somewhat obconic, often slightly one-sided; skin thick, dull yellowish-green, with a broad, dull red cheek; stalk about an inch long, curved, scarcely sunk; basin shallow, sometimes deep; flesh greenish, very juicy, melting, of a fine, pleasant, agreeable flavor. On some localities not first-rate. Ripens early in autumn. Very productive and fair. Shoots diverging. Origin, Dorchester, Mass.

Angleterre. (*Syn.* English Beurré, *of Lind.*, Beurré d'Angleterre.) Medium size, obconic-pyriform, acute, regular; skin thick, dull light green, thickly dotted with russet, with a thin brownish russet cheek; stalk about an inch

long, slender; basin smooth, scarcely sunk; flesh buttery, melting, juicy, with a rather poor flavor. Early in autumn. Productive. A common market fruit at Paris.

Autumn Colmar. Medium in size, obtuse-pyriform; pale green; stalk an inch long, slightly sunk; calyx small, closed, basin slightly furrowed; flesh gritty at core, buttery, second-rate in flavor. Ripens at mid-autumn. Flemish.

Beurré Duval. Medium size, obconic-pyriform, pale green, stalk half to three-fourths of an inch long, under a lip, cavity small; calyx erect, basin shallow; flesh greenish white, rather coarse, melting, buttery, good second-rate, variable. Late autumn. Resembles Andrews, but not so good. Belgian.

Beurré Van Marum. Medium in size, sometimes rather large, oblong-pyriform, rather irregular; skin yellow; stalk long, slender, cavity flattened; calyx large, basin shallow, irregular; flesh melting, juicy, sweet, agreeable. Mid-autumn. Productive, and bears young. A good second-rate pear. Flemish.

Beurré Van Mons. Medium size, pyriform; yellow, russeted; a third-rate fruit. Mid-autumn.

Calebasse. (*Syn.* Calabash.) Size medium, or rather large; long-pyriform, neck elongated, acute, body round, rather small; surface uneven or knobby, yellow, partly russeted; stalk an inch and a quarter long, oblique, not sunk; calyx short, erect, basin small, ribbed; flesh coarse, breaking, juicy, sugary, pleasant; second-rate. Early autumn. Belgian.

Calebasse Grosse. Very large, obconic-oblong; smooth, shining, yellowish green; stalk stout, an inch long; flesh rather coarse, half melting, tolerably good. Belgian.

Capiaumont. (*Syn.* Beurré de Capiaumont.) Size medium; obconic-pyriform, quite acute, approaching turbinate, regular; skin smooth, yellow, with cinnamon red to the sun, distinctly dotted, slightly russeted; calyx widely reflexed, not sunk; stalk about an inch long, but varying;

flesh white, buttery, melting, moderately juicy, sweet, often astringent, about second-rate. Hardy and productive. Leaves folded, recurved. Ripens about mid-autumn. Belgian.

Clara. Size, medium; oval-pyriform; clear yellow, with a blush, dotted red; stalk stout; calyx and basin small; juicy, melting, somewhat acid; second or third-rate. About mid-autumn. Shoots stout, dark brown. Belgian.

Comprette. Size, medium, or rather large; obtuse-pyriform; yellowish green, thickly dotted with brown; stalk short, stout, thickened at insertion; basin shallow; flesh buttery, melting, rich, good, often nearly first-rate. Middle and late autumn. Belgian.

Countess of Lunay. Size medium; obovate-pyriform, somewhat obconic; skin smooth, pale waxen yellow, with a thin red cheek; stalk about an inch and a half long, set without depression on the rounded point of the neck, which is slightly russeted; basin very small, even; flesh white, very juicy, melting, fine—nearly or quite first-rate. Mid-autumn.

Délices d'Hardenpont. Size medium; obtuse-pyriform; pale yellow, dotted in the shade and russeted in the sun; stalk an inch long, obliquely set, cavity small; calyx small, closed, basin plaited, uneven; flesh buttery, melting, rich. Mid-autumn. Belgian.

Edwards' William. Medium in size, obtuse-pyriform; yellow, sunny side with red dots, flesh yellowish white, buttery and melting, good. Early autumn. Origin, New-Haven.

Figue. Medium or rather large, pyriform-pyramidal, regular, body rounding to the apex; skin thin, green, partly russeted at crown, often a dull red cheek, stalk an inch long, stout, very fleshy at insertion, not sunk; basin none; flesh rather coarse, melting, juicy, rich, high-flavored. Late autumn. This pear has been cultivated and proved fine at Boston. There are some doubts of its identity with the Figue of the London Horticultural Society.

Forelle. (*Syn.* Trout Pear.) Medium or rather large, pyriform, approaching oblong-obovate; green, becoming clear yellow, with a deep vermillion cheek, dots margined with crimson; stalk an inch long, slender, cavity moderate; basin rather abrupt and narrow; flesh buttery and melting, second-rate. Late autumn. Shoots dark, purplish; leaves small, nearly flat. German. A pear of great beauty, which has contributed to its reputation.

Harvard. Medium or rather large, oblong-pyriform; skin russety olive yellow, and with a reddish cheek; stalk rather stout, sunk little or none, oblique; basin narrow; flesh juicy, melting, tender; rots at the core if not house-ripened. First of autumn. Very productive, growth vigorous, fruit handsome, rendering it profitable for market, although only second-rate in quality. Origin, Cambridge, Mass.

Jersey Gratioli. Size medium; regularly formed; pale brown, somewhat rough, basin round, even; flesh melting, rich. Growth erect, vigorous, buds hoary. New.

Lodge. Size medium, pyriform, neck small, narrow, very acute, sometimes ribbed and irregular; greenish brown, much russeted; stalk an inch and a fourth long, rather stout and curved; basin varying from very shallow to deep and distinct; flesh very juicy and melting, with a rich, vinous, or sub-acid Brown Beurré flavor. Early and mid-autumn. Origin, near Philadelphia, where it proves first-rate, but farther north it does not stand so high.

Napoleon. Medium or rather large; obconic-pyriform, obtuse, variable; green becoming pale yellowish-green; stalk an inch long, stout, slightly sunk; basin rather large; flesh uncommonly juicy, melting, moderately rich, good, sometimes astringent. From mid-autumn till winter. Needs ripening in a warm room. Very productive, thrifty, hardy. Shoots rather erect. Belgian. Best on warm light soils.

Pailleau. Medium in size, pyriform-turbinate; skin rough, greenish yellow, partly russeted; stalk about an inch long, very stout; basin small; flesh juicy, sweet, tolera-

bly good; second-rate. Early autumn. Overbears. Belgian.

Pitt's Prolific. (*Syn.* Pitt's Surpasse Marie.) Medium size, oblong-pyriform, rather acute; yellow, with a broad brownish-red cheek; stalk curved, fleshy at base; flesh juicy, hard, coarse; third-rate. English.

Pope's Quaker. Size medium, oblong-pyriform, with smooth yellow russet, juicy, melting, pleasant; second or third rate. Mid-autumn. Long Island, N. Y.

Queen Caroline. (*Syn.* Reine Caroline.) Medium in size, narrow-pyriform, greenish becoming yellow, with a reddish cheek; stalk an inch long, curved, sunk little or none; flesh white, crisp, dry; third-rate. Late autumn.

St. Ghislain. Size medium; pyriform, neck narrow, acute, tapering; surface pale yellow, sometimes a faint blush; stalk an inch and a half long, curved with fleshy rings at insertion; basin very shallow; flesh white, buttery, juicy, with a fine flavor. Growth upright, vigorous, shoots light brown. Somewhat variable in quality, from first to second-rate. Belgian. Early autumn.

Styrian. Medium or rather large; obconic-pyriform; surface warm deep yellow, sometimes a bright red cheek, with russet streaks or patches; stalk an inch and a half long, slender, often fleshy at insertion; basin small, irregular; flesh slightly granular, crisp, often juicy and melting, second-rate, often nearly first-rate in flavor. A profuse bearer. Ripens mid-autumn. English.

Sullivan. Medium in size, oblong-pyriform, neck acute, tapering; greenish yellow; stalk an inch and a half long, stout; flesh juicy, melting, second-rate. Early autumn. Belgian.

Bilboa and Washington pears, of next class, approach this class in outline.

Section III.—Small.

Yat. Rather small, pyriform-turbinate, slightly compressed; densely russeted; stalk an inch long, slender.

oblique, not sunk; calyx small, basin shallow; tender, juicy, rather rich. Early autumn. Dutch. A third-rate pear; soon decays.

CLASS II.—OBSCURE PYRIFORM, OBOVATE, OR TURBINATE.

Section I.—Large Pears.

Beurré d'Amalis. (*Syn.* Beurré d'Amanlis.) Large, obovate, often slightly irregular, sometimes slightly pyriform, with a short and narraw neck; dull yellowish green, with some russet, and a dull reddish cheek; stalk an inch and a quarter long, very slightly sunk; basin shallow; flesh buttery, melting and juicy, and rather rich, with a second-rate flavor. Early and mid-autumn. A good grower, great bearer alternate years, and always perfects its fruit. Growth spreading. Belgian.

BEURRE D'ANJOU. Rather large, obovate, approaching obconic, obtuse, regular; surface greenish-yellow, a dull red cheek to the sun, clouded with russet; stalk quite short, or half an inch long, slightly sunk, cavity uneven; basin shallow, round smooth; flesh yellowish white, fine-grained, buttery, melting, with a high, rich, vinous, excellent flavor. Middle and late autumn. French.

Beurré Knox. Large, oblong-obovate, obconic, acute; surface pale green, with some thin russet; stalk an inch long; basin small, narrow; flesh tender, juicy, but not high-flavored. Early mid-autumn. Flemish. Of little value.

Brown Beurré. (*Syn.* Beurré Gris, Gray Beurré, Beurré Rouge, Red Beurré, Beurré Isambert.) Large, often only medium; oblong-obovate, with a rounded taper to the stalk; skin yellowish green, russeted; stalk an inch to an inch and a half long, rather oblique, thickening into the fruit; basin rather shallow; flesh greenish white, very juicy, melting, buttery, with a rich sub-acid or vinous flavor. Early mid-autumn. Highly esteemed by those who prefer a vinous

flavor. Partially fails in many localities; needs rich, high cultivation. Wood short-jointed, flexuous, leaves folded.

Capucin. Rather large, oval, sometimes obtuse turbinate: surface greenish, becoming pale yellow; slightly russeted at ends, reddened next the sun; stalk nearly an inch long, cavity obtuse; basin deep, narrow, irregular; flesh greenish, juicy, crisp, rather rich; second-rate. Mid-autumn. Belgian.

Chapman. Rather large, obovate, sometimes slightly pyriform, obtuse, largest at the middle, tapering each way; surface clear lemon yellow; stalk nearly two inches long, cavity shallow, wrinkled; calyx erect, basin ribbed; flesh yellowish-white, very juicy, half breaking, rather acid; sometimes astringent; second-rate. Pa.

Chancellor. Large, obovate, green; stalk an inch long, rather thick, cavity small, irregular; calyx small, basin contracted; flesh melting, rich, very agreeable. Ripens about mid-autumn. Origin, Germantown, Pa. New.

Copia. Large, broad-turbinate, acute; yellow slightly russeted; stalk long, stout, fleshy at insertion; calyx large, basin slightly furrowed; flesh coarse, juicy, rather rich. Mid-autumn. Origin, Philadelphia.

Dunmore. Large, oblong-obovate; surface greenish, with dots of brownish red russet; stalk an inch and a half long, stout, fleshy at insertion, scarcely sunk in the obtuse and rounded base; calyx small, deep-set; flesh buttery, melting, rich, good, but not first-rate. Early autumn. English, raised by Knight.

Flemish Beauty. (*Syn.* Belle de Flandres.) Large obovate, often obscurely tapering to the crown, very obtuse; surface slightly rough, with some reddish brown russet on pale yellow ground; stalk an inch and a quarter long, rather slender, cavity round, deep, narrow, often acuminate, rim obtusely rounded; basin small, round; flesh juicy, melting, often with a very rich, sweet, and excellent flavor, but variable, and sometimes not high-flavored; needs house-ripening. Shoots dark brown, growth vigo-

rous, tree productive, and fruit always fair and handsome. Very valuable—its chief and perhaps only deficiency is a frequent want of a full, high, rich flavor. It must be gathered while yet hard, and ripened within doors. The Beurré Spence, so long the "Great Unknown" of pomologists, is commonly believed to be no other than this variety.

Great Citron of Bohemia. Large, oblong, yellow, spotted and tinged with red next the sun; stalk an inch long; flesh juicy, with a second or third-rate flavor.

Jalousie. Rather large, varying from roundish to obovate-pyriform; surface smooth, deep rich russet, with clear defined, lighter dots; stalk an inch and a quarter long, cavity and basin narrow and small, sometimes rather deep; flesh white, dry, and with poor flavor. Mid-autumn. Shoots stout, olive. Handsome and worthless. French.

Shenks. Rather large, roundish-obovate, obscurely ribbed, crown flattened; light yellow, often a light red cheek; stalk one inch long; basin deep; flesh white, a little gritty, tender, melting, sub-acid, second-rate. Needs house-ripening. Mid-autumn. New-England.

Van Buren. Large, obovate, crown flattened; surface clear yellow, with an orange red blush, dots conspicuous; flesh white, crisp, sweet, for baking only. Handsome. New-Haven, Conn.

Van Assene. Rather large, obovate, slightly angular; crown obtuse, sides rounded; skin fair, smooth, dull yellow; stalk an inch and a qurater long, slender, curved, moderately sunk; calyx closed; flesh white, rather coarse, buttery, melting, rich. Belgian.

Onondaga, and Dutchess of Angouleme, of the preceding class, approach this in form.

Section II.—Medium in size.

Abbott. Medium in size, oblong-obovate, (like the Washington,) surface even, smooth, dark dull green, with a reddish brown cheek changing to scarlet, stalk an inch

long; calyx small, closed; melting, juicy, rich. Early mid-autumn, Good and handsome. Providence, R. I.

Alpha. Medium, obovate, slightly oblong; greenish yellow, with red dots to the sun; stalk an inch long, slightly sunk; basin round; flesh juicy, buttery, sweet, fine. Mid-autumn. Belgian.

Ananas. Medium or large, obovate-obconic, dull or greenish yellow, stalk stout, short, fleshy at insertion, calyx closed, basin narrow, angular; melting, juicy, rich. Mid-autumn. France. New. The Ananas d'Eté is distinct, and requires further investigation.

Ambrosia. Size medium, round-obovate, slightly flattened at ends; skin greenish-yellow, thickly dotted; stalk about an inch and a half long, cavity rather broad and shallow; calyx erect or closed, basin wide, plaited; flesh slightly breaking, buttery, good second-rate, often only third-rate. Early in autumn. French.

Belle Lucrative, or Fondante d'Automne. Size medium, obconic-obovate, sometimes remotely pyriform; surface pale yellowish-green, slightly russeted; stalk an inch and a quarter long, often fleshy, oblique; cavity very small and narrow; calyx short; basin smooth, sometimes furrowed; flesh very juicy, with a fine texture, melting, rich, excellent. Very variable—when well grown and fully ripened, it has no superior and few equals, in its exceedingly rich, delicate, perfumed flavor—but often of poor quality. Early mid-autumn. Belgian. Growth moderate, upright, shoots yellowish-gray.

Belmont. Size medium; roundish-obovate; skin yellowish-green, a faint reddish-brown cheek to the sun; stalk two inches long, slender curved; flesh rather coarse, juicy, sweet, second-rate—first-rate for cooking. Mid-autumn. English.

Bergamotte Cadette. (*Syn.* Beauchamps, Beurré Beauchamps, Poire de Cadet.) Size medium; round-obovate, or round-oval; surface greenish-yellow, often russeted, frequently tinged with reddish-brown to the sun; stalk an inch and a fourth long, scarcely sunk on the rounded base

calx erect or closed, basin very shallow; flesh melting, buttery, juicy, sweet, quite rich, slightly perfumed; nearly first-rate. Late autumn. Productive. French.

Beurré Colmar. (*Syn.* Beurré Colmar d'Automne.) Size medium, oval-obovate, regular, smooth; skin greenish yellow, often a blush; stalk an inch long; basin shallow, narrow, irregular; flesh white, crisp, becoming juicy and melting, not rich.

Beurré Crapaud. Medium size, round-obovate, obtuse; surface smooth, yellow, with a red cheek; stalk short, cavity shallow; basin broad, shallow; flesh fine-grained, melting, juicy, high-flavored, perfumed. Somewhat resembles White Doyenné, but higher colored. Mid-autumn. Shoots light yellow. New.

Beurré de Beaumont. Medium size, roundish-obovate or roundish-turbinate; skin yellowish green, thinly dotted dark green, and a faint dull red cheek; stalk an inch long, very slightly sunk; sometimes set under a lip; calyx short, basin shallow, smooth; flesh buttery, melting, juicy, rich; nearly or quite first-rate. Early mid-autumn. French. New.

Beurré Kenrick. Medium size, obconic-obovate, crown flattened; greenish yellow; stalk an inch long; flesh juicy, sweet, buttery; second or third-rate. Early autumn. Flemish.

Beurré Preble. Medium, sometimes rather large, oblong-obovate, sometimes roundish-obovate, usually an acute, slight neck; skin greenish yellow; stalk stout, an inch long, cavity little or none; basin small; flesh melting, buttery, sweet, rich, with high flavor, but varying to second-rate. Late autumn. Origin, Maine.

Beurré Romain. Medium in size, obovate; light yellowish green; stalk short, not sunk; calyx prominent; flesh juicy, melting, of second-rate quality. Early mid-autumn.

Bezi de Montigny. Medium size, or rather large, obovate, obtuse, sometimes remotely pyriform, regular; skin smooth

pale yellowish green; stalk an inch long. stout, much enlarged from the fruit; calyx small, erect; cavity and basin small, smooth; flesh half-buttery, melting, juicy, and quite sweet, perfumed—good second-rate. Mid-autumn. Resembles Urbaniste externally. French.

Bon Chrétien Fondante, or "Melting Bonchretien." Size medium; roundish, slightly oblong, rarely short-obovate, obtuse; surface dull green, partly russeted, numerously dotted; stalk an inch long, moderately or slightly sunk; basin small; flesh yellowish white, core yellow and rather gritty,—melting, very juicy, rich, pleasant—often nearly first-rate, somewhat variable. Ripens about mid-autumn or later. Leaves conspicuously folded and recurved. Flemish.

Boucquia. Medium or rather large; oval-obovate; skin pale yellow and pale red, partly russeted, stalk an inch and a quarter long, fleshy at insertion; calyx large, erect, scarcely sunk; flesh juicy, melting, second or third-rate.

Buffum. Size medium; obovate, approaching oblong; skin yellow, with a broad, reddish brown cheek, somewhat russeted; stalk three-fourths to an inch long, stout; cavity and basin moderate or small; flesh buttery, sweet, good, not quite first-rate, slightly variable. Shoots strong, reddish brown, very erect; tree very productive. Valuable for its fair fruit, and fine bearing qualities. Early mid-autumn. Origin, Rhode Island.

Cabot. Size medium, round-turbinate, slightly irregular, crown full, obtuse; stalk an inch long, set on the pointed base without depression; surface rough, russeted, bronze yellow; basin round, smooth; flesh greenish white, breaking, somewhat melting, juicy, sub-acid, about second-rate. Early mid-autumn. Tree vigorous, very productive. Origin, Salem, Mass.

Commodore. Size medium; regular obovate, or obovate-pyriform, with a short narrow neck; surface yellow, with a little red, thickly dotted, and with some russet; stalk an inch and a quarter long, scarcely depressed; calyx small, reflexed; basin very shallow; flesh juicy, melting,

buttery, sweet, with a second-rate, sometimes nearly first rate flavor. Late autumn. Belgian.

Cushing. Medium or rather large, obovate, somewhat obconic; surface light greenish yellow, rarely a dull red cheek; stalk an inch long, cavity abrupt; basin rather shallow; flesh fine grained, buttery, melting, with a fine flavor—nearly first-rate. Ripens in the early part of autumn. Shoots spreading. Very productive. Origin, Hingham, Mass.

Dallas. Size medium; obovate, slightly obconic-pyriform, dull yellow, often much russeted; stalk an inch long, not sunk; basin round, slightly wrinkled; segments of the calyx rounded, stiff; flesh fine-grained, melting, juicy, good. Ripens late-autumn. Conn.

De Louvain. Medium size, obovate-obconic, approaching pyriform; surface light yellow, faintly russeted, with ruddy dots to the sun; stalk an inch long, stout, oblique, not sunk; basin very narrow, shallow; flesh buttery, melting, rich, good. Ripens through mid-autumn. Belgian.

Doyenne Boussock. (*Syn.* Doyenné Boussouck Nouvelle.) Large, thick obovate, obconic, sometimes slightly pyriform, slightly uneven; surface bright lemon yellow when ripe, partly russeted, sometimes a slight reddish cheek; stalk stout, about an inch long, varying, sometimes fleshy, often oblique; basin very shallow, even; flesh buttery, melting, very juicy, with a first-rate flavor, resembling the White Doyenné, but not equal to it in quality. New. The Gray Doyenné has been cultivated to some extent under this name.

Duchesse de Mars. Size medium or rather small; obovate, slightly pyriform; skin dull yellow, partly russeted; stalk an inch long, scarcely sunk on the rounded base; calyx closed, basin very small; flesh melting and juicy, rather rich. Ripens late autumn. A second-rate fruit. French.

Dundas. Size medium; short turbinate, sometimes obovate, base flattened; skin yellow, with a brilliant blush; stalk an inch long, stout, not sunk; calyx small, basin wide,

Fig. 171—*Beurré d'Anjou.* Fig. 172—*Golden Beurre of Bilboa.* Fig. 173—*Washington.*

deep and even; flesh half-buttery, tender, melting, rich, perfumed. Mid-autumn. A handsome Belgian variety, of nearly first-rate quality.

Edward's Elizabeth. Medium in size or rather large; roundish-obovate, sometimes approaching obtuse pyriform, somewhat angular, smooth; surface a beautiful, clear, waxen, pale yellow; stalk often planted in a fleshy protuberance; flesh buttery, slightly sub-acid, good. Mid-autumn. Origin, New Haven, Conn.

Enfant Prodigue. Size medium, or rather small; obovate, varying, base always narrow; surface rough, slightly uneven, tawny yellow, russeted; stalk an inch and a half long, scarcely sunk, or under a lip; calyx closed, crumpled, basin slight, narrow, furrowed; very juicy, sub-acid, rather rich. Very variable in form and quality. Late autumn. Belgian.

Figue de Naples. (*Syn.* Fig pear of Naples.) Medium, or rather large; oblong-obovate, sometimes slightly obovate-pyriform, base very obtuse; surface yellowish-brown, with a faint reddish cheek; stalk an inch long, fleshy at insertion; basin broad, shallow, smooth; flesh buttery, rich, but becoming dry instead of melting, unless kept from the air, the skin being quite pervious to moisture. Ripens late autumn. Hardy and productive.

Forme de Délices. Medium size, obovate, yellowish, rough, much russeted; stalk an inch long, cavity round, smooth, calyx large, projecting; flesh buttery, melting, somewhat dry, of good flavor. Late autumn. Belgian. Shoots stout, upright, yellowish-green.

Jones. Size medium or rather small, obovate, often pyriform; surface rich yellow russet; stalk an inch or an inch and a fourth in length, variable in thickness, fleshy at insertion, not sunk; basin shallow; flesh yellowish, melting, of fine flavor. Ripens late autumn. Origin, Kingsessing, near Philadelphia. New.

Golden Beurre of Bilboa. (*Syn.* Bilboa, Hooper's Bilboa.) Rather large; obovate, slightly pyriform, rather obtuse, very regular; surface smooth, fair, fine yellow

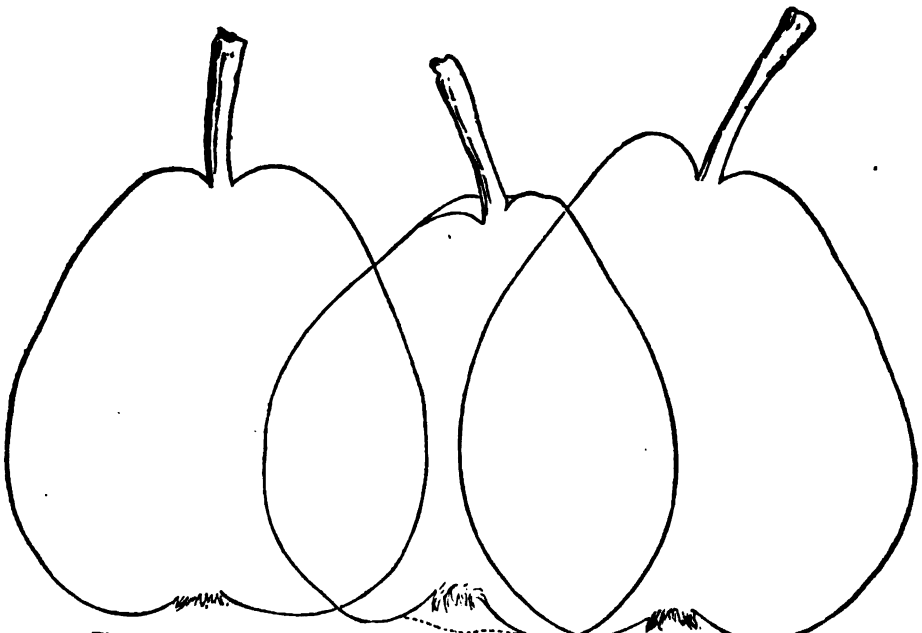


Fig. 174—*White Doyenne.* Fig. 175—*Gray Doyenne.* Fig. 176—*Doyenne Boussuck.*

russeted round the stalk; dots small, distinct; stalk an inch and a quarter long, slightly sunk; calyx small, erect, basin shallow; flesh fine-grained, very buttery, melting, moderately rich—sometimes a very obscure acid astringency. Ripens the first of autumn, and immediately follows the Bartlett. Its fair fruit, and productiveness, render it a very valuable pear, although, like the Flemish Beauty, it is not of the highest flavor. Grows well on the quince. A native of Bilboa, Spain.

GRAY DOYENNE. (*Syn.* Doyenné Gris, Gray Butter Pear, Red Doyenné, Doyenné Rouge, St. Michael Dore.) Size medium, obovate, often approaching turbinate; whole surface a handsome smooth cinnamon russet; stalk half to three-fourths of an inch long, cavity quite narrow; calyx small, closed; flesh with a very fine texture, very buttery, melting, rich, perfumed, delicious, excellent. Middle of autumn to winter. Shoots yellowish or grayish brown, ascending. Fails on some localities.

Green Yair. (*Syn.* Green pear of Yair.) Medium size, obovate, green, juicy, third-rate. Early autumn.

HEATHCOT. (*Syn.* Gore's Heathcot.) Medium size; obovate, regular, base obtuse; surface greenish yellow, partly overspread with thin russet; stalk an inch long rather stout, cavity moderate or small; calyx partly closed, basin small; flesh fine-grained, buttery, with a rich, perfumed, and excellent flavor—sometimes hardly first-rate. Early mid-autumn. Shoots upright, reddish brown. Very productive and profitable. Origin, Waltham, Mass.

Henkel. Medium or rather large, round-obovate, remotely pyriform, with a very short neck; obtuse; surface yellow, often a clear pale yellow, sometimes partly russeted; stalk an inch and a half long, slightly sunk; basin small, even; flesh yellowish white, buttery, melting, juicy, sprightly, fine, sometimes only second-rate. Belgian.

Héricart. Size medium, obovate, remotely pyriform, often irregular, greenish yellow, with numerous confluent dots; stalk an inch and a quarter long, slightly sunk; basin small; flesh melting, buttery, not rich, second or third-rate. First of autumn. Belgian.

Hull. Medium size, obovate, rounded at base; skin yellowish green, some russeted; stalk an inch and a half long, rather slender, not sunk; basin shallow; flesh melting, juicy, slightly gritty at core, sweet, often good, sometimes only third-rate. Origin, Swanzey, Mass.

Jalousie de Fontenay Vendee, or "Fontenay Jalousie." Size medium, obconic-turbinate, approaching thick-pyriform; surface a pale dull yellowish green, more or less russeted, often a faint red cheek; stalk an inch long, often oblique, not sunk; calyx closed, stiff; basin small, round, flesh buttery, melting, mild, rich, fine-flavored, nearly or quite first-rate. Ripens at mid-autumn. French.

Knight's Seedling. Medium or rather large; obovate, approaching obconic-pyriform, smooth yellowish green; stalk an inch long, scarcely sunk; basin broad, shallow; juicy, melting, sweet. Early autumn. A native of Rhode Island.

Louise d'Orleans. Medium in size, oblong; stalk an inch long, stout, slightly sunk; calyx small, basin very shallow; skin a bronzed green; flesh very white, fine-grained, juicy, melting, rich. Late autumn. Belgian. New. May prove valuable.

Messire Jean. (*Syn.* Monsieur Jean, John, Mr. John.) Medium size, roundish, slightly pyriform, crown slightly narrowed; surface roughish, mostly russeted on yellow ground; stalk an inch long, cavity small; calyx small, basin small, smooth or plaited; flesh gritty, breaking, juicy, second or third-rate. Late autumn or early winter. Old French.

Oliver's Russet. Size medium, obovate-obconic, base rounded; a deep cinnamon russet on yellow ground, tinged red to the sun; stalk about an inch long, rather slender, scarcely sunk; basin and calyx small; flesh melting, juicy, sometimes fine, usually second-rate. Mid-autumn. Origin, Lynn, Mass.

Oswego Beurre. Size medium, obtuse oval-obovate, regular; surface yellowish green, with some thin russet; stalk three-fourths of an inch long, stout, deep-set; calyx small, erect or closed, basin smooth; flesh melting, juicy, with

a fine slightly sub-acid Brown Beurré flavor, nearly first-rate,—regarded as fully first-rate by those who like the vinous flavor of the Brown Beurré and Beurré d'Aremberg. Middle and late autumn. Profusely productive Origin, Oswego, N. Y.

Howell. Size medium, pyriform, neck small, acute; stalk an inch and a half long, not sunk; calyx in a small round basin; surface pale yellow; flesh melting, buttery, and fine. Ripens mid-autumn. Origin, New Haven, Conn.

Paquency or *Payency.* Size medium; obovate-obconic, approaching pyriform, acute; skin dull yellow, slightly russeted, with a faint dull blush; stalk an inch long, stout; calyx erect, basin shallow; flesh white, juicy, melting, good. Mid-autumn. French. New.

Pennsylvania. Size medium, obovate, often short obovate, obconic; surface a rich brownish russet on yellow ground; stalk an inch and a half long, not sunk; sometimes slightly sunk; calyx small, basin shallow; flesh rather coarse, somewhat breaking, half-melting, with a second-rate flavor. Early mid-autumn. Shoots diverging, reddish brown. Origin, Philadelphia.

Petré. Medium size, obovate, sometimes slightly obovate-pyriform, or truncate-obconic, base wide or obtuse; surface pale yellow, often slightly russeted, with a reddish brown cheek; stalk about an inch long, rather stout, cavity obtuse at bottom; basin small, smooth; flesh fine-grained, sometimes slightly gritty, buttery, melting, rich, sweet, perfumed, often excellent—variable in quality from first to second rate. Ripens at mid-autumn. Growth moderate, shoots rather slender, yellowish.

Pope's Scarlet Major. Medium or rather large, obovate; surface yellow with a red cheek; stalk long, thick; flesh breaking, dry,—third-rate. Long Island, N. Y.

PRATT. Mediu · or rather large, obovate-pyriform, skin greenish-yellow, thickly dotted; stalk an inch long, slender, moderately sunk; basin wide, shallow; flesh tender,

inch long, cavity obtuse, small; calyx short, stiff, scarcely cut; basin shallow; flesh slightly coarse, buttery, melting, with a rich, somewhat aromatic, fine flavor. Middle and late autumn. Leaves with very wavy margins.

Trescott. Medium in size, round-obovate, light orange yellow, sometimes partly russeted; stalk one and a half to two inches long, slender, slightly sunk by a fleshy knob; basin slightly plaited; flesh white, fine-grained, melting, juicy, pleasant. Early mid-autumn. A native of Cranston, R. I.

WASHINGTON. Medium in size, oblong-obovate, obtuse,—sometimes slightly obtuse-pyriform; surface smooth, clear yellow, handsomely marked with conspicuous red dots on the sunny side, slightly russeted round the stalk, which is an inch and a fourth long, and slightly sunk; calyx small, partly closed, basin shallow; flesh very juicy, melting, slightly breaking, with a rich, unusually sweet, perfumed, first-rate flavor. Early in autumn. Growth vigorous, shoots very straight, erect, and diverging. Fruit always fair, but varies in size and form—esteemed most by those who like a very sweet flavor.

Westcott. Size medium, roundish-obovate; green, becoming yellow; flesh melting, juicy, rich, sweet, perfumed; flavor fine. Early in autumn. Origin, Cranston, R. I.

WHITE DOYENNE. (*Syn.* Butter Pear, *of Pa.*, Virgalieu, *of N. Y.*, St. Michael, *of Boston*, Yellow Butter, White Beurré, Doyenné, Doyenné Blanc.) Medium or rather large, regular obovate, obtuse, sometimes remotely pyriform; surface pale yellow, often a faint blush; stalk about an inch long, scarcely sunk; calyx small, basin shallow; flesh of very fine texture, white, buttery, melting, rich, and excellent. Middle to late autumn. Shoots ascending, greyish yellow; leaves folded, recurved. It fails in many localities near Boston and elsewhere, but through inland New-York and in most of the western states, it is unsurpassed in its excellent qualities of hardy growth, fair fruit, delicious flavor and great productiveness; many trees, without receiving any care in cultiva-

tion, yielding ten or fifteen bushels of perfect fruit in a single season.

North of 42 degrees of latitude, it becomes a late autumn fruit, and may be kept into winter, which increases its value for distant market.

Wilbur. Medium in size, frequently rather small; obovate, regular, often obovate-pyriform; skin a dull green and russet; stalk three-fourths to one inch long, cavity very small; calyx prominent, scarcely sunk; flesh rather coarse, melting, juicy, pleasant, often slightly astringent, varying from second-rate to nearly first-rate. Valuable at its season. Early autumn. Shoots slender, yellowish brown. Origin, Somerset, Mass.

Wilkinson. Size medium, obovate, narrowed somewhat towards the crown, largest in the middle; skin smooth, bright yellow; stalk an inch and a quarter long, stout, scarcely sunk; calyx stiff, short, basin shallow; flesh white, juicy, melting, sweet, rich, of good flavor. Ripens from mid-autumn to winter. Shoots long, stout, upright, greenish yellow; tree thrifty, hardy, productive. A good second-rate variety. Origin, Cumberland, R. I.

Forelle and Capiaumont, of the preceding class, often approach this class in outline.

Section III.—Small.

Capsheaf. Rather small; short-obovate, wide at crown, somewhat obconic, or with a rounded taper to the stalk; surface deep yellow, mostly russeted; stalk an inch long, stout, slightly sunk; calyx small, basin rather large; flesh melting, juicy, buttery, mild, sweet, good second-rate. Ripens mid-autumn. Shoots erect, stout, yellowish brown; very productive. Rhode Island.

Dumortier. Obovate, dull yellow, with some russet; stalk an inch and three-fourths long, slender; basin very shallow; flesh greenish white, melting, sweet, sometimes high flavored. Early autumn. A third-rate Belgian variety.

Edward's Henrietta. Medium or rather small; obovate, crown flattened, stalk on a rounded point; surface smooth, pale yellowish-green; stalk an inch and a half long;

calyx closed, basin shallow, faintly plaited; flesh melting, juicy, sub-acid. Very productive. Late summer. New Haven, Conn.

Henry IV. (*Syn.* Henri Quatre.) Rather small, round-obovate, somewhat turbinate; surface greenish yellow, often somewhat russeted, sometimes a dark reddish brown cheek; stalk an inch and a fourth long, slender, usually fleshy at insertion, not sunk; basin shallow, abrupt, calyx closed; flesh juicy, melting, rich, perfumed, mostly first-rate flavor. Needs house-ripening. Early in autumn. Shoots diverging or spreading, yellowish brown. Very productive.

Johonnot. Rather small, roundish-obovate, sometimes nearly round, irregular; skin pale greenish-yellow and yellowish-brown, faintly russeted; stalk about an inch long, thick, oblique, fleshy at insertion, not sunk; basin round; flesh rather coarse, melting, buttery, rich, of fine flavor. Early mid-autumn. Origin, Salem, Mass. The value of this fine little pear is lessened by the slow growth of the tree.

Manning's Elizabeth. Small, obovate, obscurely pyriform, smooth, yellow, with a lively blush; stalk an inch long, cavity round, shallow; flesh very melting, saccharine, sprightly, high-flavored, first-rate. Ripens the first of autumn. Belgian.

Rousselet de Rheims. Rather small, obovate-turbinate, obscurely pyriform; skin greenish-yellow in the shade, a rich brownish-red in the sun, partly russeted; stalk an inch long, not sunk; basin little or none; flesh of fine texture, sweet, rich, perfumed, half buttery; rots at the core. Early autumn.

SECKEL. Small, obovate, sometimes obscurely obconic-pyriform, regular; skin brownish-green, becoming rich yellowish-brown, with a deep brownish-red cheek; stalk one-half to three-fourths of an inch long, cavity and basin small; flesh very fine-grained, sweet, very juicy, melting, buttery, the richest and highest flavored pear known. Although of slow growth, and small size, like the Green

Gage among plums, it is regarded as the standard of excellence. Its high musky perfume is not, however, agreeable to all. Early mid-autumn. Shoots stout, short, ascending, tree very hardy. Needs rich cultivation. Origin, near Philadelphia, and succeeds well throughout the northern, middle, and western states, and is remarkably free from the blight.

Williams' Early. Size rather small or medium, obovate, varying to roundish-turbinate, regular; skin smooth, clear light yellow, with a bright red cheek of thick scarlet dots on the sunny side; stalk an inch and a fourth long, straight, not sunk, often fleshy at insertion; basin small, slightly furrowed; flesh yellowish white, rather coarse, melting, half buttery, juicy, rich, slightly musky. Ripens the first two weeks of autumn. Shoots dark. A good second-rate fruit, valuable for ripening before the most of autumn pears. Origin, Roxbury, Mass.

Swan's Egg. (*Syn.* Moor-fowl Egg, *incorrectly.*) Small, oval or obovate, crown narrow; skin pale green, with a pale brownish blush; stalk an inch and a fourth long, slender, scarcely sunk; basin none; flesh soft, juicy, sweet, somewhat musky. A third-rate variety, ripening about mid-autumn. Shoots dark, long, flexuous. Old English.

Class III.—Roundish or oblate.

Section I.—Large Pears.

Belle et Bonne. Large, roundish, slightly oblate, and remotely obconic, base much flattened; surface pale greenish yellow, thickly dotted; stalk an inch and a half long, slender, cavity deep, narrow; calyx closed or erect, basin broad; flesh white, coarse, sweet, buttery when well ripened, of second-rate quality. Ripens rather early in autumn. Growth strong.

Bezi de la Motte. Rather large, often only medium, roundish, crown flattened, tapering slightly to the stalk, and sometimes with a very obscure short neck; skin dull green, becoming yellowish-green; thickly and very conspicuously dotted, the whole surface with a gray cast; stalk an inch long, slightly sunk; basin abrupt, deep, sometimes flattened and shallow; flesh yellowish green, very tender, juicy, melting, with sometimes a little grit, sweet, pleasant, not rich. Quite variable—in some localities uniformly good, in others often worthless. Tree hardy, vigorous, a profuse bearer, and fruit always fair—in flavor it is but second-rate, but very agreeable and melting. Ripens through mid-autumn. Old French.

Charles of Austria. (*Syn.* Charles d'Autriche.) Large, roundish, greenish-yellow, slightly russeted, thickly and conspicuously dotted with brown specks; stalk an inch long, slightly sunk; basin rather narrow; flesh tender, juicy, sweet, of second-rate flavor. Mid-autumn. Shoots stout, upright, yellow-olive.

Crassane. Large, roundish, flattened; skin greenish yellow, netted thinly with russet; stalk long, slender, curved, cavity shallow; calyx small, basin narrow, rather deep; flesh soft, juicy, about third-rate in quality. Middle and late autumn. Shoots stout, spreading. Old French.

Gansel's Bergamot. (*Syn.* Brocas Bergamot.) Rather large, sometimes only medium; roundish-oblate, more or less approaching obovate, flattened most at crown; skin yellowish-brown, with a faint russet brown blush; stalk short, half or three-fourths of an inch long, ends often fleshy; cavity and basin smooth; flesh granular, melting, juicy, rich, sweet, perfumed, with a first-rate flavor. Ripens through several of the early weeks of autumn. Shoots dark gray, spreading, leaves flat, mealy. English.

Hacon's Incomparable. Rather large, roundish, tapering a little to the base, crown slightly flattened; surface roughish, yellowish green, slightly russeted, stalk an inch and a fourth long; calyx short, erect, open; cavity and basin broad, shallow; flesh buttery, melting, sub-acid, of

second-rate flavor. Ripens middle and late autumn. Shoots olive, rather slender, diverging or spreading. English.

Stevens' Genesee. Large, round-obovate, often considerably flattened; skin slightly rough, yellow; stalk an inch long, stout, thickest at insertion, more or less sunk in the base; calyx short, stiff, basin smooth; flesh moderately fine-grained, half buttery, slightly granular, with a rich, fine flavor, nearly first-rate. Ripens the first of autumn and for some time afterwards. Shoots gray, leaves narrow. Grows with great vigor on the quince. Origin, Livingston Co., N. Y.

Section II.—Medium in size.

Althorpe Crassane. Size medium, roundish, or round-ovate, sometimes slightly oblong, tapering rather most to the crown, which is flattened; surface light green, with dark green specks; stalk an inch and a half to an inch and three-fourths long, curved, scarcely sunk; calyx many-cut, erect, basin rather shallow, with a few plaits; flesh fine-grained, juicy, melting, somewhat buttery, good second-rate. Middle and late autumn. English.

Bergamotte Cadette. (*Syn.* Beauchamps, Beurré Beauchamps, Poire de Cadet.) Size medium; round-obovate, smooth; pale green or greenish-yellow, often partly russeted; stalk thick, an inch long, cavity shallow; calyx small, closed, or erect, scarcely sunk; flesh slightly granular, melting, juicy, pleasant, with a good, nearly first-rate flavor. Late autumn. French.

Calhoun. Size medium, roundish, regular, remotely obovate, smooth, yellow, sometimes a little russeted, and with a red cheek; stalk three-fourths of an inch long, stout, scarcely sunk, calyx closed, basin very shallow, flesh juicy and melting, with a sub-acid or vinous flavor. Late autumn. Origin, New-Haven, Conn. New.

Compte de Lamy. Size medium, roundish, somewhat obconic or turbinate, crown much flattened; skin yellow, with a brownish blush; dots small, many; stalk an inch and a fourth long with no cavity; basin shallow, smooth;

flesh fine-grained, buttery, melting, rich, high-flavored. Ripens about mid-autumn. Resembles Dundas in form, without the deep wide basin and high red cheek of that variety. Shoots upright, dark. Belgian.

Huguenot. Medium size; roundish, pale-yellow; dots large, red; stalk rather slender, without cavity; calyx small, basin round; flesh half-breaking, sweet, deficient in flavor. Third-rate. Mid-autumn. Salem, Mass.

Michaux. Medium size, nearly round; skin yellowish green, with a faint blush; stalk an inch and a half long, cavity little or none; basin shallow; flesh juicy, half buttery, sweet, second or third rate. Early mid-autumn. French.

Naumkeag. Medium in size, roundish, russeted, cavity very shallow; flesh juicy, melting, somewhat astringent, second or third-rate. Mid-autumn. Salem, Mass.

Rousselet de Meester. Medium size, roundish, often slightly oblate, with an obscure, very short neck; skin pale greenish yellow; sometimes a faint blush; stalk an inch and a half long, cavity none; calyx large, basin small, irregular; flesh melting, sugary, rich, with some roughness of flavor—a good second-rate pear. Mid-autumn. Belgian.

Sylvange. (*Syn.* Green Sylvange, Bergamotte Sylvange.) Size medium, roundish-obovate, approaching turbinate; skin pale green, with numerous rough small dots; stalk one inch long, slender; basin shallow; flesh greenish-white, fine-grained, juicy, melting, tolerably good. Middle and late autumn. Shoots stout, dark olive.

Sieulle. (*Syn.* Beurré Sieulle, Doyenné Sieulle.) Medium in size, roundish-oblate, often roundish-obovate, with a very short, obscure neck; obtuse; skin pale yellow, with a slight blush, and sometimes a brilliant broad orange cheek; stalk thick, an inch and a quarter long, cavity shallow, rarely deep; calyx slightly sunk; flesh buttery, fine-grained, rich, of good second-rate or nearly first-rate quality. Middle and late autumn.

Section III.—Small.

Aston Town. Rather small, roundish, remotely turbinate, crown flattened; skin rough, brownish green, becoming yellowish; stalk an inch and a half long, cavity little or none; calyx large, erect, scarcely sunk; flesh melting, buttery, sweet, tolerably good. A third-rate English pear, ripening before mid-autumn. Shoots slender, growth irregular.

Bergamot, Autumn. (*Syn.* English Bergamot, Common Bergamot, *of the English*, English Autumn Bergamot.) Rather small, roundish-oblate, rough, greenish; stalk half an inch long, stout, cavity round, wide; calyx small, basin smooth, shallow; flesh juicy, sugary, rather rich; about third-rate in value. Early autumn.

Bergamotte d'Automne. Roundish-obconic, remotely pyriform; smooth, fair, pale yellow, with a brownish red cheek; stalk an inch and a fourth long, cavity and basin slight; flesh breaking, juicy, sweet, not rich. French. Quite distinct from the preceding, and worthless.

Bleeker's Meadow. Rather small, roundish, or flattish-obovate; very regular; large specimens are short-obovate; surface yellow; stalk an inch long, stiff, calyx open, both slightly sunk; flesh very sweet, approaches buttery and melting when at its best, but usually remains hard and worthless. Middle and late autumn. Growth rapid, upright, very productive. Varies from second to fourth-rate. Origin, Pennsylvania.

Croft Castle. Size rather small or medium; form ovate, tapering considerably from base to crown; greenish yellow, thickly dotted and roughened with small specks; stalk an inch and a half to two inches long, slender, curved, not sunk; calyx widely reflexed in the flat narrow crown; flesh crisp, juicy, sweet, second-rate. Mid-autumn. English.

Eyewood. Small, regular round-oblate; pale yellowish green, becoming dull yellow, thickly dotted, a faint brownish tinge to the sun; stalk very long; cavity and basin small; buttery, melting, rich, fine, sub-acid like the

Beurré d'Aremberg. Late autumn. Buds large, with prominent shoulders, whence its name. English. New.

Fulton. Rather small or nearly medium; roundish, crown flattened; whole surface a smooth gray russet, becoming a dark cinnamon russet; stalk an inch and a quarter long, slender, cavity round, rather narrow; calyx long, deep-cut, basin uneven; flesh half-buttery, melting, rich, sprightly, agreeable, nearly or quite first-rate. Ripens middle and late autumn. Shoots rather slender, reddish brown. Tree very hardy and productive. Valuable. Origin, Topsham, Maine.

Moor-fowl Egg. (*Syn.* Little Swan's Egg.) Rather small, roundish, dull green, with a brown cheek, dots *minute*; stalk long, slender, little sunk or under a lip; basin small, flesh soft, juicy, gritty, sweet; a third-rate Scotch pear, ripening about mid-autumn.

Princess of Orange. Rather small, roundish, slightly necked; color cinnamon and light reddish russet; stalk an inch long; cavity, calyx, and basin small; flesh yellowish white, crisp, juicy, vinous; about second-rate, sometimes very poor. Late autumn. Belgian.

Quiltette. Size nearly medium; roundish, slightly oblate; skin greenish, nearly covered with dull, iron-colored russet; stalk an inch and a quarter long, fleshy at insertion, with no cavity; calyx very small or abortive, basin narrow; flesh melting, buttery, sweet, rich, perfumed; good second-rate, sometimes nearly first-rate. Late autumn. Belgian.

DIVISION III.—WINTER PEARS.

CLASS I.—DISTINCT PYRIFORM.

Section I.—Large Pears.

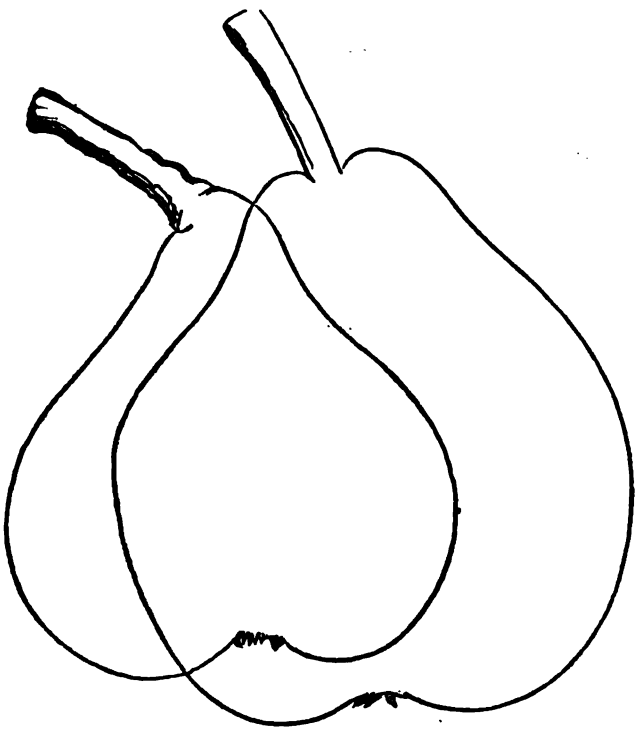


Fig. 177—*Beurre d'Aremberg.* Fig. 178—*Glout Morceau.*

BEURRE D'AREMBERG. (*Syn.* Duc d'Aremberg, Deschamps, L'Orpheline.) Large, short obconic-pyriform, approaching obconic-obovate, neck rather small; skin thick, greenish-yellow, partly russeted; stalk short or

half an inch to an inch long, thick, oblique, thickening with flesh towards insertion; calyx erect; basin deep, narrow; flesh buttery, melting, rich, with a high, subacid flavor—regarded as fully first-rate by those who esteem a vinous flavor. Ripens late autumn and early winter—keeps with little care. Very productive. Grows well on the quince. Leaves slightly waved. Belgian.

RIVERS says that Orpheline or Soldat Laboreur, of the French, is a variety of Beurré d'Aremberg, having larger fruit and less thorns than the common Beurré d'Aremberg, the former never having thorns. THOMPSON differs from Rivers.

A very different pear with the name of Soldat Laboreur, or Soldat d'Esperen, is described by Rivers as a large turbinate pear, half-melting, high-flavored and excellent—the tree robust, and a great bearer—ripening about mid-winter.

Black Worcester. (*Syn.* Iron Pear, Black Pear of Worcester.) Large, pyriform, approaching oblong-ovate; body large, short ovate; neck short, rather obtuse; surface mostly covered with dark rough russet on a light green surface; stalk half an inch to an inch and a half long. cavity none; calyx erect, basin small; flesh hard, coarse, rich, somewhat austere; stews and bakes well. An esteemed culinary sort, bearing heavy crops, and proving very profitable for market. Late autumn till mid-winter. Growth very crooked and straggling.

Catillac. Large, short obconic-pyriform, approaching broad-turbinate, crown broad, flattened; yellow, often with a reddish brown cheek; stalk an inch to an inch and a half long, stout, cavity small, wavy; calyx short, erect or spread, basin large, plaited; flesh hard, but excellent for baking and stewing, becoming tender, and of a light red color. Keeps through winter. French.

Chaumontel. (*Syn.* Bezi de Chaumontelle, Winter Butter.) Large, pyriform, body oblong or ovate, neck short, obtuse, often quite obscure, and the form approaching obovate or oblong,—largest at the middle; skin a little rough, yellowish in the shade, with more or less brownish red and and rich deep red in the sun; stalk an inch long, mode-

rately sunk; basin deep, uneven, or angular; flesh buttery, melting, sugary, with a fine flavor. Requires warm rich cultivation to develope its good qualities. Shoots long, slender, dark brown. Grows well on the quince. Early Winter. Old French.

Glout Morceau. (*Syn.* Gloux Morceaux, Beurré d'Hardenpont, Colmar d'Hiver, Hardenpont d'Hiver, Linden d'Automne.) Large, short pyriform, approaching obtuse-oval, neck very short and obtuse, body large, and tapering somewhat towards the crown; often considerably ribbed; surface green, becoming pale greenish yellow; stalk an inch and a fourth long, not oblique, stout, fleshy on quince stocks, moderately sunk; calyx large, basin distinct, rather irregular; flesh white, fine-grained, buttery, melting, rich, sweet, with no acid, and of fine flavor. Early winter. Succeeds best on the quince. Preferred to Beurré d'Aremberg by those who like a sweet pear—and differs from it in its sweet flavor, shorter neck, more rounded or tapering crown, even (not oblique) stalk, and more obtuse neck.

Louise Bonne. Large pyriform; smooth, pale green; stalk rather short, straight, slightly enlarged towards insertion; calyx small, basin shallow; flesh white, rather coarse, third-rate in quality. Early winter. Old French.

Pound. (*Syn.* Winter Bell, Angora.) Very large, pyriform, approaching obconic, crown wide; skin yellowish-green, with a brown cheek; stalk two inches long, calyx crumpled, basin narrow; flesh solid, hard, stems reddish color, a first-rate culinary pear. Trees strong, healthy, productive; shoots stout, upright, dark. Uvedale's St. Germain nearly resembles or is identical with this variety.

Spanish Bonchretien. (*Syn.* Bon Chrétien d'Espagne.) Large, pyriform, irregular, narrowed to the stalk, one-sided; surface deep yellow at maturity, with a bright red cheek, and reddish brown dots; stalk an inch and a half long, bent slender, scarcely sunk; basin rather deep, narrow, irregular; flesh white, crisp, or half breaking, moderately rich—first-rate for cooking—worthless as a dessert fruit.

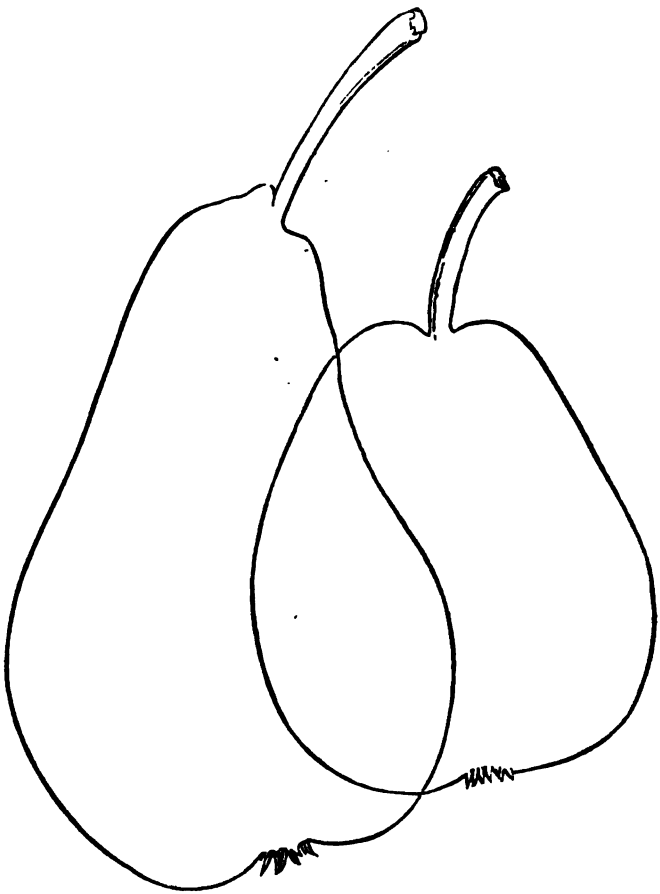


Fig. 177—*Vicar of Winkfield.* Fig. 178—*Prince's St. Germain.*

St. Germain. Large, long obconic-pyriform; surface yellowish green, faintly tinged with brown to the sun; stalk an inch long, oblique; basin small and shallow; flesh white, slightly gritty, juicy, melting, sweet, and agreeable; fails in many localities, and becomes a third-rate fruit. Late autumn and early winter. Shoots slender, light olive; leaves narrow, folded and recurved. The Striped St. Germain is a sub-variety, differing only in its faint yellow stripes.

Vicar of Winkfield. (*Syn.* Le Curé, Monsieur le Curé, Clion, Dumas.) Quite large; long pyriform, approaching oblong-obconic, with a conical taper towards the crown; skin smooth, pale yellow, or pale yellowish-green, with a dull reddish cheek; stalk an inch to an inch and a half long, slender, often fleshy at insertion, oblique, not sunk; basin narrow, very shallow; flesh greenish or yellowish white, juicy, buttery, with a good, second-rate flavor—sometimes slightly astringent, but if ripened in a warm temperature it proves a good table pear. Ripens late autumn and early winter, for about three months. Growth spreading and irregular, or straggling, shoots strong, dark olive. Fine on quince stocks. The great and uniform productiveness of this pear, its fine qualities for cooking, and the long period of its continuance, render it eminently valuable. It was formerly cultivated at Boston under the erroneous name of Bourgermester. The true Bourgermester is a third-rate pear, the wood of which cankers badly.

Section II.—Medium in size.

Beurré Rance. (*Syn.* Beurré de Ranz, Beurré de Rance, Hardenpont du Printemps, Beurré Epine, Beurré de Flandre.) Size medium, obtuse pyriform; dark green, roughish; stalk an inch and a half long, cavity very shallow or none; calyx small, basin slight; flesh greenish white, melting, gritty at core; when well ripened, sweet, juicy, and of fine flavor, Only second-rate as far north as Boston, but better further south. Ripens late in winter and in spring. Shoots brownish-yellow, straggling; leaves flat. Originated at the village of Rance, near Mons, in Belgium.

Colmar. Medium in size, or large, pyriform, obtuse; skin smooth, pale greenish yellow, becoming light yellow; stalk an inch and a half long, rather stout, bent, cavity often uneven; basin wide, deep; flesh half buttery, melting, juicy, rich—about second-rate. Early winter. Bark of the tree very rough.

Jaminette. (*Syn.* Josephine.) Medium or rather large, obovate-pyriform, approaching obovate, small specimens roundish turbinate, varying; crown broad; skin yellowish-green, with some brownish russet; dots numerous, often confluent; stalk three-fourths to an inch long, thick, cavity little or none; calyx small, erect, stiff; basin round, even; flesh juicy, melting, buttery, sweet, of good second-rate flavor. Late autumn and early winter. Origin, Metz, in France.

Las Cañas. Size medium, regular pyriform, somewhat obconic; neck tapering into the stalk; skin yellow, sometimes sprinkled with thin russet, rarely with russet blotches, dots small and numerous; stalk an inch long; calyx slightly sunk; flesh juicy, melting, good, nearly first-rate.

Passe Colmar. (*Syn.* Colmar Souverain, Colmar Hardenpont, Colmar Gris.) Medium or rather large; skin yellowish green, becoming pale yellow, often lightly sprinkled with russet; stalk an inch and a quarter long, cavity obtuse or none, calyx erect, basin moderate; flesh fine-grained, buttery, juicy, sweet, rich, and when well grown and ripened, of excellent, first-rate flavor—but when overloaded, with small, badly matured fruit, the quality is worthless. The tree overbears, and the fruit needs thorough thinning. Leaves rather small, nearly flat. Early winter. Belgian.

Vicompte de Spoelberch. Medium or rather large, obovate-pyriform, somewhat obconic; skin slightly rough, yellow, with a purplish blotched cheek to the sun, very slightly russeted; stalk an inch and a fourth long, stout, curved; basin round, shallow; calyx erect, short; flesh buttery, melting, rich, fine. Needs high cultivation to develope its fine qualities. Early winter. Belgian.

CLASS II.—OBSCURE PYRIFORM, OBOVATE, OR TURBINATE.

Section I.—Large Pears.

Columbia. (*Syn.* Columbian Virgalieu, Columbia Virgouleuse.) Large, long obovate, regular, handsomely rounded or obtuse, largest near the middle; surface pale green, becoming pale yellow, always smooth and fair; stalk an inch and a quarter long, rather slender; cavity narrow, deep; calyx erect, basin small; flesh white, melting, and buttery, of moderately rich, second-rate or third-rate flavor. Ripens early winter. Growth upright, vigorous, shoots brownish yellow. The large, handsome fruit, and the great productiveness of the tree has rendered this variety popular and profitable for market. It does not appear to succeed so well as far north as Boston and Rochester, as further south. A native of Westchester County, New-York.

Easter Beurré. (*Syn.* Doyenné d'Hiver, Bergamotte de la Pentacôte, Beurré de la Pentacôte, Beurré de Pâques, Chaumontel tres gros, Canning, Seigneur d'Hiver.) Large, obovate, approaching oval; surface yellowish-green, with some russet; often a broad, dull reddish cheek; stalk stout, an inch long, cavity deep, sometimes obtuse, abrupt; calyx small, closed in a moderate or rather shallow, plaited basin; flesh fine-grained, very buttery, melting and juicy, and when well grown and ripened, of excellent, first-rate flavor. It does not often mature well in the northern states. Keeps through winter. Growth strong, rather upright, shoots reddish-yellow; leaves narrow, folded, recurved. Grows well on the quince.

Knight's Monarch. Large, regular, obovate; surface yellowish-brown, reddish to the sun, dots numerous; stalk very short, half an inch long, thick; set on the rounded base with little or no cavity; basin shallow; flesh buttery, melting, rich, of fine quality. Mid-winter. Shoots yellowish. Scarcely as yet proved in this country, spurious sorts having been widely disseminated. English.

Black Worcester, Chaumontel, and Glout Morceau, of the preceding class, often approach this class in form of outline.

Section II.—Medium in size.

Beurre Gris d'Hiver Nouveau, or "Gray Winter Beurré." Size medium; obovate, obtuse; skin greenish, considerably russeted; stalk thick, short, cavity moderate; basin small; flesh greenish, buttery, melting, very juicy, rich, slightly sub-acid—resembling in flavor the Beurré d'Aremberg, but rather richer and less acid. Early winter. French. New. Promises to become valuable.

Bezi Vaet. Size medium, obovate; skin rather rough, greenish yellow, russeted with a brown cheek; stalk an inch and a fourth long, cavity and basin slight; flesh juicy sweet, with a second or third-rate flavor. Early winter.

Brande's St. Germain. Size medium; obovate, often considerably pyriform, narrowing to both ends, smooth and regular; skin yellowish green, thickly dotted with large russet specks; stalk an inch long, thick, obliquely set; calyx small, stiff, erect; basin small, narrow, often none; flesh buttery, melting, yellow towards the core, with a pleasant, slightly acid, good, nearly first-rate flavor. Early winter. English. New.

Caen du France. Medium in size, obovate, largest at the middle, skin with a rough russet; stalk an inch long, cavity and basin rather small; flesh tender, juicy, rather sweet, resembling Winter Nelis in flavor, but less melting. Ripens at mid-winter.

Comstock. Medium in size, obovate; yellow with a crimson cheek; stalk and calyx slightly sunk; flesh crisp, sprightly, about third-rate in quality—handsome but poor. Early winter. Shoots long, upright, reddish yellow. Origin, Dutchess Co., N. Y.

Coter. Size medium, obovate, obscurely pyriform, nearly regular, light yellowish green, brown in the sun, somewhat russeted; stalk an inch long, without cavity; segments of the calyx distinct and widely reflexed; basin

round, moderate; flesh white, rather coarse, buttery, rich, slightly perfumed, nearly or quite first-rate. Late autumn. Belgian.

Easter Bergamot. (*Syn.* Winter Bergamot, Paddington, Bergamotte de Pâques, Bergamotte d'Hiver.) Size medium or rather large; round-obovate, approaching turbinate, narrow at stalk; surface yellowish green, dots conspicuous; stalk from three-fourths to an inch and a half long; calyx small, basin round; flesh firm, becoming melting, juicy, buttery; a second or third-rate dessert fruit, but fine for stewing, keeping through winter. Differs from Easter Beurré in its inferior quality, rounder form, lighter color, and in its green shoots.

Echassery. (*Syn.* Echasserie, Bezi d'Echasserie.) Size medium; round-oval, or irregular roundish; color pale green, becoming yellowish; often a dull reddish brown cheek; stalk an inch and a half long, cavity narrow, irregular, often very small; calyx erect, slightly cut, scarcely sunk, or on a scarcely perceptible conical taper of the crown; flesh buttery, melting, with a sweet, perfumed flavor, hardly first-rate. Shoots rather weak, joints crooked. French.

Emerald. Medium in size, obovate, irregular, crown ribbed; surface green, dotted with brown; stalk an inch and a half long, cavity narrow, irregular, often very small; calyx erect, slightly cut, scarcely sunk; flesh half-breaking or melting, very juicy, sweet, good second-rate. Belgian. New.

Flemish Bonchretien. (*Syn.* Bon Chrétien Turc.) Size medium; obovate; skin pale green, with a brown cheek; flesh crisp, juicy, and stews very tender. A first-rate culinary pear, keeping through winter.

Fondante du Bois. Size medium; obovate-turbinate, somewhat obconic; surface mottled with russet on greenish yellow; stalk three-fourths of an inch long, obliquely set and slightly sunk; basin moderate; flesh buttery, juicy, rather rich, slightly acid and astringent, with a Brown

Beurré flavor—good second-rate, approaching first-rate. Early-winter. New. Somwhat resembles Passe Colmar.

Haddington. Medium or rather large, obovate-pyriform, greenish yellow, with small distinct russet dots. Sometimes a faint brown cheek; stalk three-fourths to an inch long, slender, cavity small; calyx small, basin shallow; flesh yellowish, crisp, juicy, with a second-rate flavor—sometimes quite poor. Keeps through winter. Philadelphia.

Léon le Clerc. Medium or rather large, obovate, crown swollen, narrow towards the stalk; skin yellow, russety at ends; stalk an inch and a fourth long, fleshy at insertion; calyx large, many-cut, little sunk; flesh crisp, firm, of second or third-rate quality.

This is totally distinct from the celebrated Van Mons Léon le Clerc, a large, fine autumn pear already described. The Léon le Clerc here described was raised by Van Mons, and is hence sometimes called Van Mons' Léon le Clerc; the other variety, immeasurably superior, was raised by Léon le Clerc, and named the Van Mons Léon le Clerc. Confusion has arisen from this slight distinction.

Locke. (*Syn.* Locke's Beurré.) Medium in size, round-obovate, obscurely pyriform, regular; surface yellowish green, often a little russet; stalk an inch long, scarcely sunk; calyx small, closed, basin shallow; flesh greenish-white, melting, juicy, second-rate. Late autumn and early winter. Origin, West Cambridge, Mass.

McLaughlin. Medium in size, turbinate, remotely pyriform; nearly the whole surface russeted, with a warm red cheek; stalk three-fourths of an inch long, fleshy at insertion, cavity little or none; basin rather abrupt, very small and narrow; flesh buttery, rather sweet, or very slightly acid, rich, perfumed. Early winter. Saco, Maine.

Moccas. Medium in size, obovate or irregular turbinate, surface pale green, or yellowish-green, with a brown cheek, and russet dots and streaks; stalk an inch and a

fourth long, curved, with no cavity; calyx short, erect, set shallow; flesh juicy, melting, with a rich, fine flavor. Early winter. English. New.

PRINCE'S ST. GERMAIN. Size medium; obovate, obtuse; surface much russeted on green, dull red to the sun; stalk an inch and a fourth long, cavity small; calyx large, stiff, slightly cut, basin smooth, shallow; flesh yellowish white, juicy, melting, slightly vinous, with an agreeable and fine flavor. Keeps well, ripening through winter. Origin, Flushing, Long Island.

Virgouleuse. Size medium, or rather large; obovate, rounded at both ends; smooth, yellowish-green, dots numerous; stalk an inch long, cavity little or none; calyx small, basin wide, very shallow; flesh buttery and melting, of good flavor. Early winter. A very thin bearer. Origin, Virgoulé, a village of France.

This is totally distinct from the Virgalieu or White Doyenné, already described, a greatly superior late autumn pear.

WINTER NELIS. (*Syn.* Nelis d'Hiver, Bonne de Malines.) Size medium; roundish-obovate, often slightly pyriform, with a neck small and short; surface yellowish-green, much russeted; stalk an inch and a quarter long, bent; cavity narrow; calyx stiff, short, basin shallow; flesh yellowish white, fine-grained, buttery, very melting, rich, sweet, or slightly vinous, perfumed, aromatic, with an excellent flavor. Perhaps the highest flavored of all winter pears. Early winter. Growth slender, often flexuous and straggling; leaves narrow, recurved; petioles rather long. Origin, Mechlin, in Belgium.

Section III.—Small.

Lewis. Size, below medium; regular obovate, rarely obscure-pyriform; surface yellowish green, thickly dotted with dull russet; stalk an inch and a half long, slender, scarcely sunk; calyx widely reflexed, basin little or none; flesh greenish-white, melting, juicy, of fine rich flavor. Core large. Early winter. Growth vigorous, branches becoming drooping. Profusely productive. Origin, Roxbury, Mass.

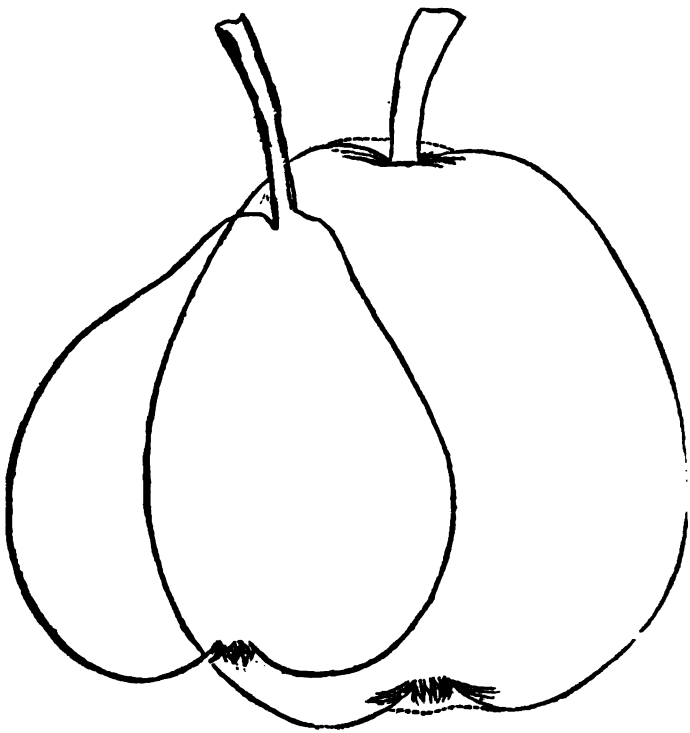


Fig. 179—*Winter Nelis.* Fig. 180—*Easter Beurre.*

Class III.—Roundish or oblate.

Section I.—Large Pears.

Beurré Bronzée. Rather large, roundish, surface rather rough, a dull russet on green, red to the sun; stalk an inch and a quarter long, with no cavity; flesh crisp, juicy, about second-rate. Early winter. The Figue de Naples is cultivated to some extent in New-England under this name.

Holland Bergamot. (*Syn.* Bergamotte d'Hollande.) Rather large, roundish, green, much russeted; stalk an inch and a half long, slender; cavity shallow, one-sided; calyx small, slightly cut, basin large; flesh crisp, flavor sprightly, about second or third-rate in quality. Keeps through spring, and is a good culinary pear. Shoots diverging or spreading, olive brown.

Gilogil. Large, oblate, approaching obovate, smooth and regular, overspread with cinnamon russet, in dots, patches, and nettings, often thickly russeted; reddish to the sun; stalk an inch to an inch and a half long, cavity uneven, sometimes deep and round; calyx erect or closed; flesh white, firm, breaking, moderately rich, nearly sweet, with a third-rate flavor. Unproductive in this country—esteemed for preserving in France, its native country. Early winter. Growth strong, upright.

Section II.—Medium in size.

Bezi d'Heri. (*Syn.* Wilding of Heri.) Size medium, roundish, skin greenish yellow, with a reddish blush; stalk an inch and a half long, slender; calyx open, basin shallow; flesh tender, juicy, free from grit, with an anise-like flavor. A fine winter culinary pear, worthless for the dessert. Early winter. French.

Broom Park. Size medium; roundish; skin brown; flesh white, juicy, melting, of second-rate flavor. Early winter. Shoots diverging or spreading, dark brown. English.

Cross. Medium in size, roundish; surface yellow, often with a red cheek, and some russet; stalk three-fourths of an inch long, very thick, set shallow; calyx small, rather deeply sunk; flesh melting, juicy, with a rich, high, fine flavor—of first-rate quality. Early winter. Shoots rather slender, greyish yellow. Origin, Newburyport, Mass.

Franc Real d'Hiver. (*Syn.* Franc Real, Fin Or d'Hiver.) Size medium; roundish, yellow, sprinkled with russet brown, and with a brownish cheek; stalk an inch long, cavity small; calyx small, basin shallow; flesh firm, crisp, fine for stewing, becoming tender, and of a light purple color. Keeps through winter. Very productive. Growth upright, leaves wavy.

Winter Crassane. Size medium, flattish turbinate, tapering to stalk, crown much flattened; skin whitish-yellow, more or less russeted, dots dark and numerous; stalk two inches or more long, curved, cavity none; calyx large, distinctly five-cut, basin large, wide, obtuse; flesh white, rather dry, about third-rate.

Section III.—Small.

Fortunée. *Syn.* Bergamotte Fortunée, Beurré Fortunée.) Rather small, or nearly medium; roundish, slightly necked, somewhat irregular; whole surface a rich cinnamon russet, (like Fulton,) stalk an inch long, usually slightly enlarged at ends; calyx small, basin round, smooth; flesh yellowish white, rich, and perfumed—when well ripened, nearly first-rate—sometimes the flesh is white, and of poor flavor. Keeps through winter.

Ne Plus Meuris. Small, roundish, usually very irregular, with swollen parts on the surface; surface rough, dull yellowish-brown, with some iron-colored russet; stalk short, cavity little or none; flesh yellowish white, buttery, melting, and juicy, good. A second or third-rate variety. Keeps through winter. Belgian.

COMPARATIVE FORMS OF PEARS,

ACCURATELY REDUCED TO ONE-HALF THE DIAMETER, FROM ACTUAL SPECIMENS.

Fig. 181. *Skinless.* Fig. 182. *Manning's Elizabeth.* Fig. 183 *Ott.* Fig. 184. *Pratt.*

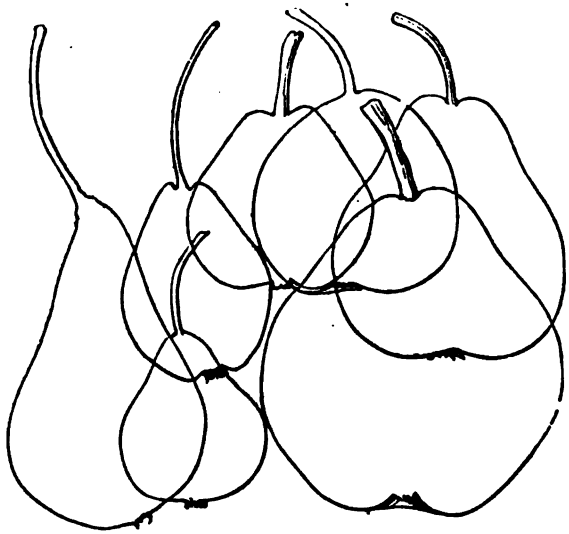


Fig. 185. *English Jargonelle.* Fig. 186. *French Jargonelle.* Fig. 187. *Onondaga, or Swan's Orange.*

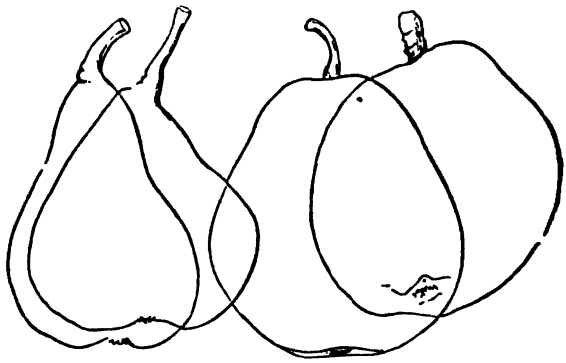


Fig. 188—(2 *outlines.*) *Brandywine.* Fig. 189. *Kingsessing.* Fig. 190. *Moyamensing.*

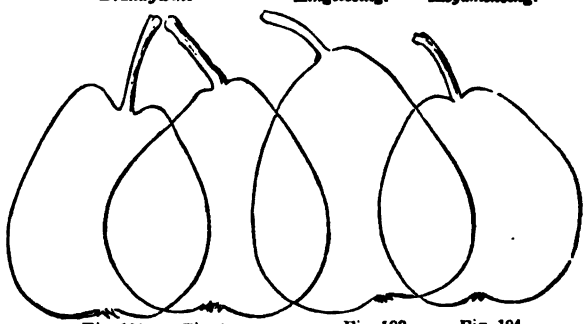


Fig. 191. *Petre.* Fig. 192 *Belle Lucrative* Fig. 193. *Fonstenay Jalousie.* Fig. 194. *Heathcot.*

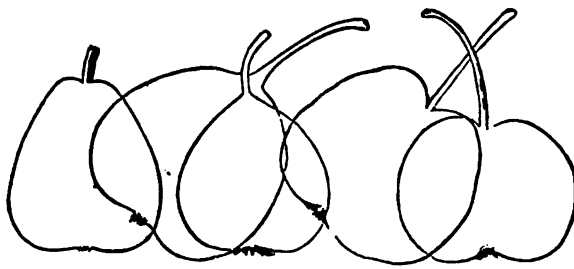


Fig. 195. *Seckel.* Fig. 196. *Henry IV.* Fig. 197. *Rousselet de* Fig. 198. *Fulton.* Fig. 199. *Eyewood.*

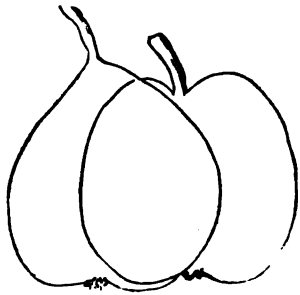


Fig. 200. *Brown Beurre.*

Fig. 201. *Oswego Beurre.*

Fig. 202. *Lawrence.*

Fig. 203. *Urbaniste.*

Fig. 204. *Fig of Naples.*

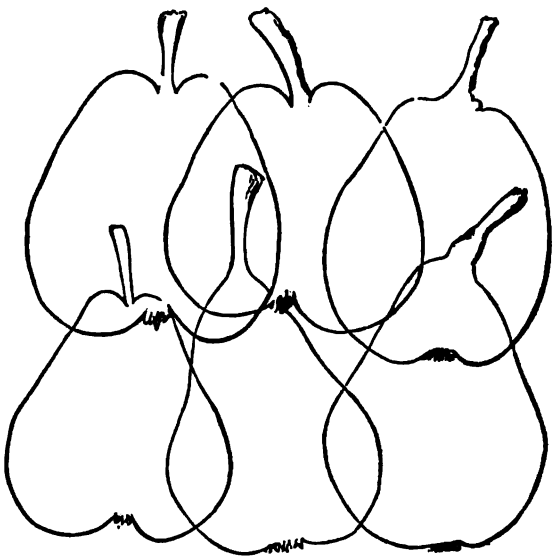


Fig. 205. *Napoleon.*

Fig. 206. *Duchesse d'Orleans.*

Fig. 207. *Figue.*

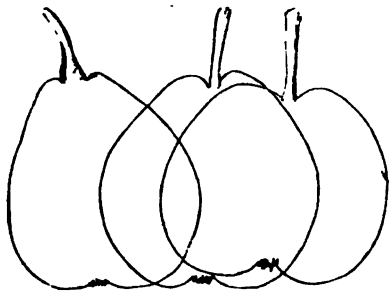


Fig. 208. *Coter.*

Fig. 209. *Caen du France.*

Fig. 210. *Bergamotte Cadette.*

Fig. 211. *Marie Louise.*

Fig. 212. *Duchesse d'Angouleme.*

Fig. 213. *Beurre Diel.*

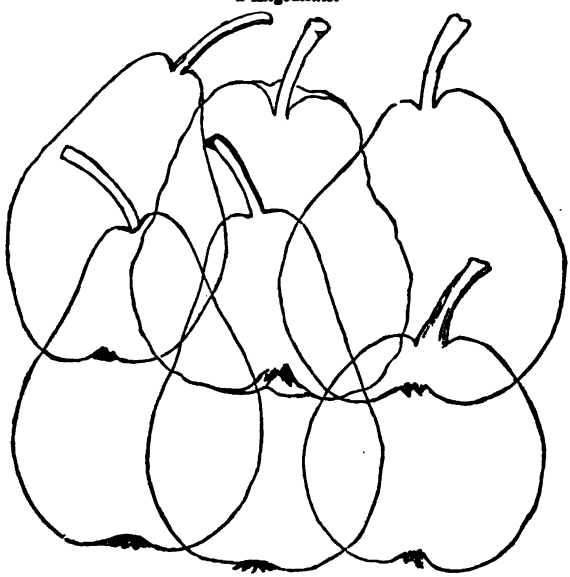


Fig. 214. *Dix.*

Fig. 215. *Van Mons' Leon le Clerc.*

Fig. 216. *Sieulle.*

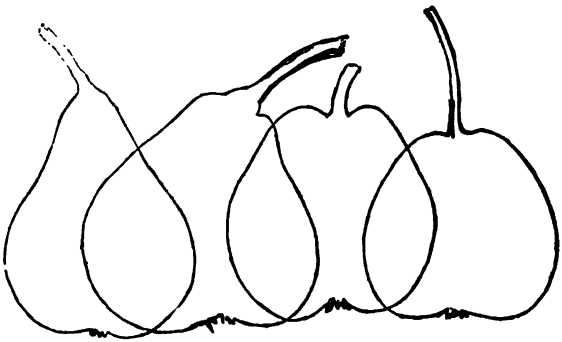


Fig. 217. *Les Cannes.* Fig. 218. *Passe Colmar.* Fig. 219. *Beurre gris d'Hiver Nouveau.* Fig. 220. *Lewis.*

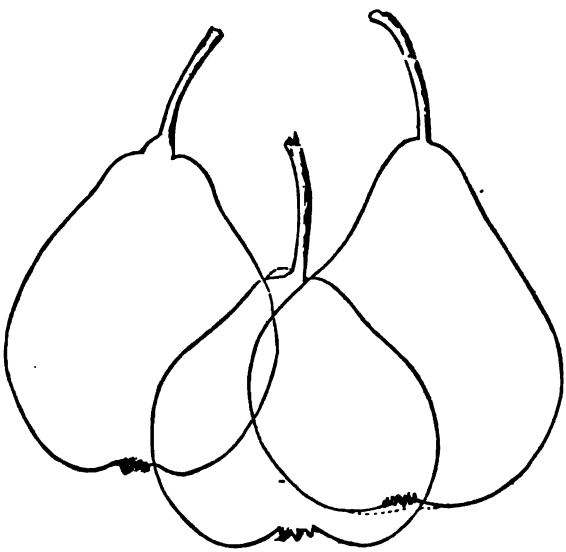


Fig. 221. *Black Worcester.* Fig. 222. *Catillac.* Fig. 223. *Pound.*

CHAPTER III.

THE QUINCE.

THE QUINCE, a small, irregularly growing tree of about ten or twelve feet high, bears one of the best fruits for preserves and jellies, and for giving additional flavor to apple tarts. It is unfit for eating in a raw state. The young trees are extensively used as stocks for the propagation of dwarf pear trees.

The quince is usually propagated by layers and by cuttings. When by cuttings, they are to be taken from the tree in the spring, and buried in an upright position, in a light, deep soil, and in a moist shaded place, not less than ten inches or a foot deep, and leaving but a small portion above ground. If the shaded place cannot be had, spread over the surface of the ground, after they are planted, a coat of moss, or partially decayed leaves. If the weather becomes very dry, water them.

To propagate by layers, the young shoots are to be laid down in the spring, and buried so as to leave only two or three buds at the extremity above ground. When these buds have well started, the best only should be left for growing. A part of them will throw out roots by autumn, and may be removed from the parent tree and set out in rows; the rest should remain a second year till rooted. If the ground is rich, and they are kept well cultivated and straightened by stakes, the cuttings and layers will produce trees fit for removal as standards in two or three years.

The soil for the quince should be deep and rich, such as will raise good corn and potatoes, and should be kept well cultivated. A rather moist soil has been preferred by many, but it is by no means essential,* deep and enriching cultivation being of incalculably more importance. In connex-

* The hardiness of the quince enabling it to endure wetter soils, than other trees, has led to this opinion; but better quinces have never been raised than on highly enriched and well cultivated dry upland.

ion with the yearly application of good manure, a special manuring of salt is eminently beneficial. The salt should be spread early in spring beneath the trees just thick enough to half conceal the surface of the ground. Common manure, without salt, will not give the finest quinces, nor will an unmanured or poor soil endure heavy doses of salt.

The total neglect of the cultivation of the quince by many who have planted out the trees, has resulted in their dwarfish and stunted growth, and entire unproductiveness. To renovate such trees, cut or saw out the thick profusion of suckers which surround the stem, (fig. 226,) deepen the soil with the space as much as the roots will admit, and apply a large barrow-load of compost to each tree, made by a thorough intermixture some weeks previously, of stable manure and

Fig. 225.

Fig. 226.

black muck, and then spread a thin coating of salt upon the surface. This should be done in the spring of the year. The pruning may be such as to remove the suckers, and reduce the number of stems to three or four, or the tree may be trimmed to one clean stem, as shown in fig. 225.

The wide difference between the results of these two modes of treatment, can be only appreciated by those who have witnessed the experiment. By neglect, the crop will at best be small, and the quinces diminutive and knotty; by enriched culture, a profusion of large golden fruit will load the tree, which will at all times command a ready sale even in a well supplied market.

In planting quince orchards, the distance asunder may be about ten or twelve feet, which will be found near enough for full-grown trees, on a deep, rich, and well-treated soil. If the ground is previously subsoiled, and well manured by trench-plowing, the young trees will come into bearing in

about three years, and continue productive, if well managed, for forty years, or more.

Quince trees, when once in good condition, need but little pruning. All that is necessary is to cut out, annually, old or decayed wood, or any branches that make the head too thick, or that prevent an evenly distributed and symmetrical form. Manure or compost should be applied late in autumn, and salt in spring.

ENEMIES.

The quince is frequently attacked by the *blight*, causing the death of the ends of the branches, and sometimes spreading and destroying the tree. The remedy is the immediate and constant excision of the injured parts, and burning them.

The *borer* sometimes proves a formidable enemy. It is the larva of an insect which attacks the wood of the trunk near the surface of the ground, and works inwards, usually upwards, but sometimes downwards, to a distance of several inches into the wood, during the summer season.

As the borer frequently destroys the tree, various means of prevention have been resorted to. The remedies described for the apple-borer are found useful. When the insect has once obtained possession, the best method appears to be direct attack. Scrape the soil from the trunk, and cut with a knife lengthwise, and not across the bark and wood, till the insects are found. Repeat the operation once a week for several times, as a part escape the first examination. Then cover the wounded parts with a mixture of warm tar with ochre or brick-dust. It is a great saving of labor to arrest early their progress; hence trees should be examined frequently. They may sometimes be extracted by a flexible barbed wire, when cutting out would too much mutilate the tree.

VARIETIES.

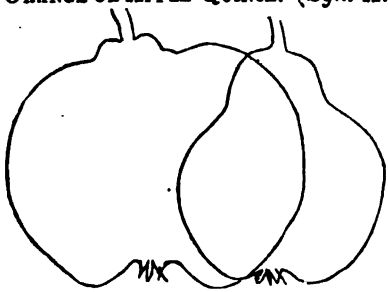


Fig. 227. *Orange Quince.* Fig. 228. *Pear Quince.*

ORANGE OR APPLE QUINCE. (*Syn.* Angers.) Large, some sub-varieties quite large, roundish, somewhat irregular, with a small and very short neck at the base; surface of a fine golden color; flesh firm, stewing rather tender, of excellent flavor. Ripens soon after mid-autumn. Leaves oval. Tree productive, if well cultivated.

This is the most common sort, and by continual propagation of seedlings, several sub-varieties have been produced, varying slightly in coarseness or firmness of texture, size and form. The largest sometimes weigh a pound. It strikes freely from cuttings, and forms the best stocks for the pear.

Pear Quince. (*Syn.* Oblong or Pyriform Quince.) Size medium or rather large, pyriform, body roundish-oblong, neck about one-half or one-third the length of the body; skin rather dull rich yellow; flesh firm, tough, dry, with a high flavor, stewing less tender than the Orange quince. Ripens late in autumn, and hence adapted to distant marketing. Leaves oblong-ovate. A moderate bearer.

Portugal Quince. Quite large, oblong-pyriform, largest at the middle and tapering to each end; yellow; flesh more juicy, and less harsh than the other varieties. Stews well, and becomes a fine purple or deep crimson when cooked. Leaves broad, cordate, downy, larger than those of the common quince, and growth stronger. The fruit is rather superior in quality, but the value of the variety is much lessened by its unproductiveness. It does not strike readily from cuttings. The common or Orange quince is often sold as the Portugal.

The Japan and Chinese quinces are cultivated merely as ornamental shrubs.

CHAPTER IV.

THE PEACH.

THE PEACH, the most delicious fruit, when in perfection, of our climate, succeeds in favorable localities, from Maine to the Gulf of Mexico. In the more northern regions, the ripening of the earlier varieties commences only a few weeks before the close of the summer months; in the extreme south, well matured peaches are obtained nearly as early as cherries and strawberries at the north.

The trees are more tender and of shorter duration than most fruit trees of temperate climates. In some localities, they bear only two or three good crops, and then decline or perish. On favorable soils, they continue for twenty or thirty years. In western New-York, trees have in rare instances borne fruit for forty or fifty years. In France, according to authentic testimony, peach trees which have been annually and freely pruned, have lived to an age of one hundred years; and there is no doubt that on favorable soils, and by a regular shortening-in pruning, most of our orchards would endure much longer than the ordinary period.

The most extensive peach-growing regions are in New-Jersey, Delaware, and Maryland. Some orchards have contained 20,000 trees, and hundreds of acres have been occupied with the plantations of single proprietors. The northern portions of Ohio and westerm New-York, protected on the north by Lakes Erie and Ontario, afford a very favorable climate for this fruit. But throughout the country at large, the selection of proper localities would doubtless afford good and regular crops. even in districts where its culture is rarely attempted. The remarks on this subject on p. 63 of this work, are particularly commended to the attention of those who may attempt the peach culture in severe climates.

The destruction of the peach crop is caused in nearly all cases by the intensely severe cold of winter. Vernal frosts, to which its loss is often erroneously ascribed, very rarely have any influence. If the fruit buds remain unswollen, they will endure almost any degree of cold to which our climate is liable.* But it often happens that we have a few days of mild or warm weather late in autumn or during winter. This is sufficient to swell them slightly, or to throw moisture enough into them to render them tender; and if the thermometer should then sink several degrees below zero, there is scarcely a chance for their escape. Their condition may be ascertained within a few days by making a cross cut with a knife through the fruit buds. If destroyed, the centre will be dark brown; if uninjured, they will present the fresh yellow centre of sound buds.

PROPAGATION OF THE TREES.

The peach tree is of remarkably easy and rapid propagation. In rare instances, seedling trees have borne the second year, or sixteen months from the planting of the stone. Stocks may be budded the first summer, affording trees five or six feet high the second autumn. Transplanted the second year from the bud, the trees with good cultivation, usually come into bearing about the third year afterwards.

Some varieties reproduce the same from the stone with slight variation, but the only certain way to perpetuate delicious sorts, is by budding. Grafting rarely succeeds.† For directions see page 42 of this work. It often happens at the north, that the severe frost of winter destroys the inserted buds, which die and drop off, leaving the attached portion of bark adhering fresh and green to the stock. This disaster, which so often disappoints the hopes of the young cultivator, is to be prevented by selecting buds from the largest and thriftiest shoots. These usually possess sufficient vigor to withstand severe frosts. The triple buds on the older and more matured portions of the shoots of bearing trees, often survive when the single buds above them perish; as may be

* Peaches are successfully raised so far north that the thermometer usually falls to 30 degrees below zero, by protecting them from the *vicissitudes* of the weather of winter, by means of a good coating of evergreen boughs.

† At the south, where the warm and moist climate often approaches in character that of a hot-house, grafts of the peach often do well, and even cuttings of the apple inserted in open ground frequently take ready root.

at once perceived by examining the shoots of bearing trees late in spring.

When stocks are not budded till the second summer, it is very important to cut them down the previous spring, and suffer but one ascending sprout to grow, which will form a fine thrifty shoot for the reception of the bud.

In raising stocks, select the seed of hardy and late varieties. The stones are not injured if kept dry in a cellar till winter. If they become water-soaked for a length of time, they are spoiled. But soaking in water for a day or two, and subsequent exposure to freezing, facilitates the cracking of the stone. One of the best modes of treatment is to keep the stones in a moist cellar till near spring, then to soak them in tubs or barrels, till the shells are well swollen with moisture. They are then placed in thin layers on the surface of the ground, and exposed for two or three weeks to the action of the frost, being protected from drying by a covering of soil, leaf-mould or muck. About the time the frost disappears from the ground, they are taken up and cracked by hand, placing the stone on the end of a wooden block, and striking a gentle blow on the side edge with a hammer. The kernels are thus taken out uninjured. They are then planted one or two inches deep, (a light thin soil needing more depth than a heavy and moist one,) and if they have been previously uninjured, nearly every one will grow. Care is needed that the seeds do not become dried nor mouldy before planting.

When it is intended for them to come up evenly, as they are to remain in the nursery row, the most certain way to avoid vacancies or failures, is to sprout them before planting. This is effected by mixing the kernels with sand and leaf-mould, and spreading them in a thin bed in the sun. When sprouted, a line or cord, permanently marked at equal distances of eight inches with a touch of paint, is stretched on the ground, and a sprouted kernel carefully inserted at every mark of the line, by means of a transplanting trowel. This insures great regularity in the rows. Accidental vacancies may be filled from a seed bed when the plants are not more than two inches high. To prevent drying, the sprouted seeds should be kept covered with a flake of wet moss or a wet cloth, until deposited in the ground; and if

the weather be dry, watering the ground may be requisite.

By planting the peach stones without cracking, a very small portion will grow, and no regularity can be attained in the rows.

If the soil is good, and the cultivator is passed between the rows as often as once a fortnight,—oftener is better,—the trees will be large enough to bud by the close of summer.

In cases where the ground cannot be prepared early for their reception, germination may be retarded by burying the uncracked stones a foot or two beneath the surface, till wanted.

The distances of the rows asunder should be about the same as for apples and other trees in the nursery, or about three and a half feet.

Plum stocks for the peach, slightly lessen the luxuriance of growth, render the trees smaller, and increase their hardiness for the extreme north by withholding the supply of sap till later in spring, and earlier in autumn, and thus favor an early maturity of the young wood. Small dwarfs are produced by budding on the Mirabelle, a diminutive variety of the plum. The plum stock is also sometimes employed to guard against the peach borer, a remedy often unsuccessful, as that insect frequently attacks the peach above the place of union.

Unlike most other fruit trees, the peach may be transplanted in the spring next after the insertion of the bud, with scarcely a check in its growth.

ORCHARDS.

The selection of locality has been treated of; the soil is a matter of importance. The following remarks of A. J. Downing on this subject, accord with general experience:—

"The very best soil for the peach is a rich, deep sandy loam; next to this, a strong mellow loam; then a light, thin, sandy soil, and the poorest, is a heavy, compact clay soil. We are very well aware that the extensive and profitable appropriation of thousands of acres of the lightest sandy soil in New-Jersey and Delaware, has led many to believe that this is the best soil for the peach. But such is not the fact, and the short duration of this tree in those dis-

tricts, is unquestionably owing to the rapidity with which the soil is impoverished. We have, on the contrary, seen much larger, finer, and richer flavored peaches *produced for a long time successively* on mellow loam, containing but little sand, than upon any other soil whatever."

In transplanting for an orchard, the practice of *shortening-in* the shoots, described in the chapter on transplanting, should be invariably attended to, as it is of the greatest importance in the safe removal of peach trees. Trees two years from the bud, where this practice is observed, will be found decidedly better than those of one year only, for the regions of the north. Fifteen to twenty feet apart is the common distance for orchards; but as better crops and better fruit is obtained where the heads are kept well shortened-in, and consequently within less compass, a distance of twelve feet only will be found sufficient. The best culture consisting in the absence of all other crops on the ground, the neareri istance will be found the most profitable. A distance of twelve feet apart will give more than three hundred trees per acre; fifteen feet less than two hundred; and twenty feet scarcely more than one hundred.

While the trees are small, the intermediate spaces between the rows may be cultivated with low hoed crops; but afterwârds it will be found best to keep the ground perfectly clean and mellow by plowing and harrowing. Where soils are very shallow, top dressing with manure in autumn, and frequent harrowing, have been found best; the roots being thus brought near the surface, deep plowing proves injurious. But where soils are deep and fertile, plowing may be occasionally resorted to without injury.

The principle on which rotation in crops is founded, dictates that two crops of peach trees, whether in the nursery or orchard, should not be given successively on the same piece of ground; diminished growth in all such instances being the result.

One of the best manures for the peach tree is ashes, whether fresh or leached; hence all composts with this constituent in large proportion, are eminently beneficial to peach orchards. When applied alone, half a peck of fresh, and half a bushel of leached ashes to each tree, is a suitable quantity. For a useful mode of application, see remarks on a future page under the head *Peach-worm*.

PRUNING.

No fruit tree needs a more regular and constant pruning than the peach, and none more frequently meets with total neglect. The young shoots, to live and flourish, need a very full exposure to sun and air. But young peach trees, if left to grow in their own way, become covered with a dense profusion of leaves. These shade the interior, and as a necessary consequence, the central shoots gradually perish, and leave the bare limbs. As the tree advances in growth, these become long, naked branches, with tufts of leaves only at their extreme ends, fig. 229. These extremeties are loaded with an overcrop of fruit, diminished in flavor by crowding, and often breaking the tree under their lever-like weight. Trees wholly neglected in pruning, usually become by this process, of little value, after the lapse of some years.

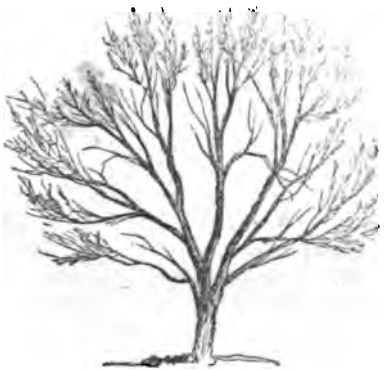


Fig. 229.

To avoid this unfavorable result, the *shortening-in* mode of pruning has been very successfully adopted, which consists in yearly cutting back the extremeties, so as to counteract the spread of the limbs, and to lessen the weight of foliage. The most easy, uniform, and certain rule to follow, in adopting this system of pruning, is to cut off, early in spring or in winter, one-third to one-half of all the shoots of the previous summer's growth. This thins the crop of fruit, and greatly reduces the amount of leaves; and while the fruit is lessened in number, the amount is not diminished, and the flavor is im-

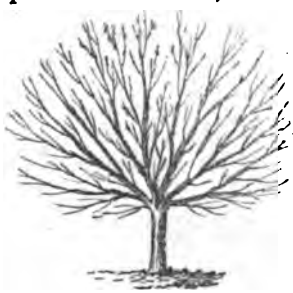


Fig. 230.

measurably improved. If this pruning is regularly and annually performed, the head of the tree will be preserved in an even, handsome, and compact shape, fig. 230, and in a healthy and vigorous condition; and it will become rarely necessary to shorten and thin out the limbs by cutting back the larger side-branches.

The pruning may be performed with a hedge or long-handled shears, or with nearly equal convenience by means of a light standing ladder and a common pruning knife.

Any cultivator who may doubt the value of shortening-in the peach, need only to try the experiment for a few successive years, on a tree standing side by side with one unpruned, to become fully convinced of its eminent advantages.*

Training the peach against walls and buildings, so essential to the successful culture of the peach in England, is rarely practiced in this country. It would doubtless hasten the maturity of the crop; but the warm exposure, would at the same time, unless the branches were purposely protected, render the crop more liable to destruction by frost. Espalier training has been found to give excellent fruit, in consequence of the thorough pruning and full exposure

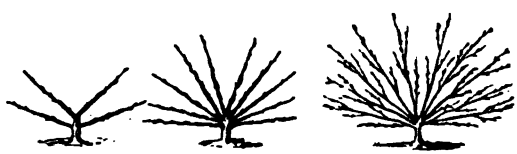


Fig. 231—First year. Fig. 232—Second year. Fig. 233—Third year.

adopted in the management of the trees. Figs. 231, 232, and 233, exhibit the fan training usually adopted in espalier and wall training, in its sucessive stages.

To induce early bearing, shorten back one-third or one-half the new shoots about midsummer, or a little sooner, which, by lessening the growth of the leaves, tends to the production of fruit buds.

* Such varieties are apt to overbear, and not come to perfection at the north, as the Heath Cling, are thinned of the crop in the most easy and perfect manner by cutting back the shoots.

DRYING AND PRESERVING.

Drying the fruit is usually performed most successfully by artificial heat. Spent ovens on a small scale,—and drying rooms, heated with stoves, fitted with shelves or drawers, with lattice or lath bottoms, on a larger scale,—are most generally adopted. Drying in the open air, is successful if the weather happens to be favorable; but decay and loss follows adverse weather. But the expense of artificial heat, and the failure from an unpropitious sky, may both be avoided by planting for this purpose the earliest ripening sorts, so that the whole work may be completed during the hot, dry weather of summer, a month earlier than the usual period.

Preserving the Fresh Fruit.—In Baltimore, and some other places, the preservation of the more delicate fruits, as peaches, apricots, and strawberries, in hermetically sealed tin canisters, is carried on on a large scale; and the fruit at mid-winter is almost as good as when gathered. The process is the same, in principle, as that by which fresh meats are preserved for sea stores. For the substance of the following account of the process, the author is indebted to THOMAS S. PLEASANTS, of Petersburgh, Va.

The canisters should be perfectly air-tight, and the contents heated throughout to the temperature of boiling water. If the vessels are then hermetically sealed, it is impossible for decomposition to take place, and therefore the most delicate fruits may be preserved for an indefinite period.

The process is minutely as follows:—Prepare the canisters in the best manner, of good tin—about seven or eight inches in length, and four to four and a half in diameter. Whatever be the size, they should be uniform, that they may be heated alike. The fruit selected should be just ripe and no more, free from specks or bruises. When the canisters are filled, the tops are to be carefully soldered on, leaving a hole in them about the size of a small pin for the escape of the air. They are then to be set in a vessel of water, to be kept boiling moderately, until the temperature of the fruit is raised to that of the water. The way in which this is ascertained, is to put a drop of water on the pin-hole, which will continue to bubble as long as the air escapes from the canister. When the internal temperature

is equal to that of the water, no more air will escape. The water is then to be wiped off, and a drop of solder immediately put in its place. The boiling water should be raised as near to the tops of the canisters as possible, so as not to cover them. If the operation has been properly conducted, the ends of the canisters will, after the cooling has taken place, be depressed, in consequence of the external pressure of the atmosphere. The degree of heat to which the fruit is subjected does not cook it in the least. It is proper that the canisters should be set in a cool place. The vessel in which the water is to be kept boiling, must of course have a level bottom; and every one who is disposed to try the experiment can devise one for himself. Doubtless a wooden reservoir, heated by steam through a pipe from a boiler, would be convenient where the experiment is performed on a large scale.

INSECTS AND DISEASES.

Peach trees are liable to injury and destruction from two causes, the *worm* or *borer*, and the *yellows*.

The *Peach-worm* or *borer*, (*Ægeria exitiosa*,) cuts into the bark (never into the *wood*,) just below the surface of the ground, and if badly or wholly girdled, the tree languishes or dies. Its presence is indicated by the exudation of gum at the root, mixed with excrementitious matter resembling saw dust. It is very easily destroyed by scraping away the earth at the foot of the trunk, and following the worm to the end of its hole with a knife, beneath the thin shell of bark under cover of which it extends its depredations. If an orchard is thus examined once in spring and once in early summer, few will escape. But to exclude the insect, as a means of prevention, heap round each tree half a peck of air-slaked lime or ashes, in spring, allowing it to remain till autumn, when, spread beneath the tree, it forms a good manure. This remedy, in many cases, has proved quite effectual. It will in all cases lessen the labor of examination with the knife.

The perfect insect of the peach worm, fig. 234, *a*, is a four-winged moth, much resembling in form a wasp, but totally distinct, and in its character and habits closely allied to the butterfly and miller. It deposits from early in sum-

mer till autumn, at the foot of the tree, its exceedingly minute, whitish eggs, which soon hatch, and the larvæ or worms enter the bark. The next season they encase themselves in a saw-dust-like cocoon, in their holes under the bark; and emerging in the perfect insect, lay their eggs and perish. The perfect insect is very rarely seen, but is easily obtained by enclosing the pupa, fig. 234, *b*, *c*, which is readily obtained in summer at the roots of neglected trees, beneath a glass, or in a gauze case. As this insect confines itself to the *bark*, its destruction is very easy. It rarely happens that trees are completely destroyed by it, except they be small; death can only take place when the tree is girdled. Timely care will prevent this; the evil in fact is only to be dreaded by negligent cultivators.

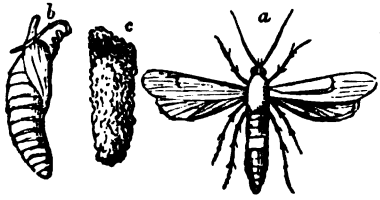


Fig. 234.

The disease termed the *yellows* is truly formidable. It is peculiar to the peach and nectarine. It has destroyed whole orchards in portions of the country, and for a time induced the entire abandonment of the peach culture in certain localities.

The cause of this malady has not been satisfactorily ascertained. According to conjecture, it has arisen originally from exhaustion by deteriorated soil, overbearing, and neglected pruning and bad cultivation. But whatever may have been its origin, it appears at present to be chiefly communicated from diseased trees. It is quickly induced by inserting the bud from an affected tree into a healthy stock. It spreads by contact with diseased roots; a knife used in pruning the tree will infuse the poison if used on another. It appears to be communicated without actual contact, the healthy branches nearest a diseased tree being usually first attacked. It is also probable that the stones from diseased trees cause its development after a few years growth. Its highly contagious nature is indicated by the equal facility with which young and vigorous trees and old and feeble ones may be inoculated by contact.

Its infallible indications, are, first, a *premature ripening of the fruit*, some weeks earlier than usual—accompanied with a rather insipid flavor, and with *purple discolorations of the flesh.* These usually occur the first season, and on a part of the tree which has been first inoculated with the poison. The following season, numerous small, wiry shoots are frequently thrown up from the larger branches, the leaves become yellow, the whole tree assumes a sickly appearance, and eventually perishes. No case is known where a decidedly developed case of this disease has ever been cured. When once attacked, to prevent a spread of the disease, the tree should be immediately removed and burned. No young trees should be planted on the same spot, as the diseased roots still remain. Stones for seedlings should be procured from districts of the country where it has not been introduced.

Peach trees, presenting a sickly appearance, have been revived by the application of iron to the roots, in the form of filings or turnings, or in the solution of the sulphate of iron or copperas; but these instances of decline do not appear to have been the contagious malady known as the yellows.

A. J. Downing, whose opinion is worthy of much attention, and who believes that the yellows is induced by exhaustion and neglected pruning, strongly relies on the efficacy of shortening-in, as a means of prevention, in connexion with the means already pointed out, and a thorough renovation of the soil by alkaline applications.

Mildew. The growth of peach trees is often retarded by mildew. It seizes the tender points of the shoots and young leaves, and sometimes wholly stops their growth. It is confined to glandless, cut-leaved varieties only; such as the Early White Nutmeg, the Early Anne, and some of the earliest varieties of the red rareripe. Yellow-fleshed peaches rarely or never suffer from it. It is not often a formidable evil, although it seriously lessens the thrifty and handsome appearance of some varieties while growing in the nursery.

It is a minute fungus, and may be destroyed or lessened without injury to the tree, by syringing with soap-suds on its first appearance. A mixture of lime-water with the soap-suds is preferred by some cultivators, and a subsequent dusting with sulphur has been recommended.

VARIETIES.

While the pear and apple are chiefly affected by the influence of soil, the variations in the quality of the peach result mostly from the effects of climate. Fine American varieties are pronounced worthless in England. In this country, some, often delicious, are of little value in unfavorable seasons. Some which succeed finely as far south as Philadelphia, lose much by removal to western New-York, from the slightly diminished warmth of the summers.

A large number of seedlings of high quality have been produced in this country, but as they vary but slightly and do not excel other named and known sorts, it becomes desirable not to extend the present list, unless by those decidedly superior to existing first-rate varieties. The similarity in quality, and the comparative shortness of the fruit season, render a small selection sufficient for ordinary collections. Hence, the main object of the following descriptive list is to define the characters of described or well-known sorts, and point out those most worthy of cultivation in our climate.

SYNOPSIS OF ARRANGEMENT.

The fruit of different varieties of the peach is marked with but few distinctive characters. A similarity in outline, texture, color and flavor, more nearly than exists in the apple, pear, and some other kinds, renders it necessary to resort to other points of distinction. The peach presents facilities for this purpose, not existing in other fruits.

1. The *Divisions* are founded on the adherence or separation of the flesh from the stone, distinguishing clingstones and free-stones; or more properly, on the firm, or melting texture of the flesh, indicated by the terms *pavies* and *melters*.

2. The Divisions are sub-divided into *Classes*, embracing *pale*, or *light-colored* flesh, and *deep-yellow* flesh.

3. The *Sections* are founded on the *glands of the leaves*. Section I, comprehends those whose leaves are deeply and sharply serrate, (or cut like saw-teeth,) and having no glands (or gum-like minute knobs) at the base, fig. 235. Section II, contains those whose leaves are crenate or serrulate, (with shallower and more rounded teeth,) and having *globose glands*, fig. 236. Section III, includes all those whose leaves are crenate or serrulate, having reniform (or kidney-shaped) glands, fig. 237. "The form of the glands," observes Lindley, "as well as their position is perfectly distinct; they are fully developed in the month of May, and they continue to the last permanent in their character, and are not affected by cultivation. The globose glands are situated, one, two, or more, on the foot stalks, and one, two, or more, on the *tips* or *points* of the serratures of the leaves. The reniform glands grow also on the footstalks of the leaves, but those on the leaves are placed *within the serratures*, connecting, as it were, the upper and lower teeth of the serratures together; their leaves, when taken from a branch of a vigorous growth, have more glands than the leaves of the globose varieties. It will, however, sometimes happen that glands are not discernible on some of the leaves, especially on those produced on weak branches; in this case, other branches must be sought for which do produce them."

Fig. 235. Fig. 236. Fig. 237.

4. The sections thus formed are each divided into two *sub-sections*; the first embracing those which have *large flowers*, as in fig. 238; and the second including such as bear *small flowers*, fig. 239. The sub-sections are in most cases

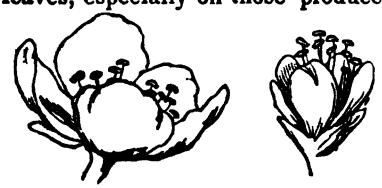


Fig. 238. Fig. 239.

distinctly marked; but a few doubtful intermediate flowers may immediately be referred to the one or the other by the color of the petals, the smaller being reddish or pink, and the larger nearly white, or with light margins.

DIVISION I. FREESTONES OR MELTERS.

CLASS I. FLESH, PALE OR LIGHT COLORED.

Section I. Leaves serrated, without glands.

Sub-section I. Flowers large.

Double Mountain. (*Syn.* Double Montagne.) Medium in size; roundish, narrow at apex; surface pale greenish white, with a slight soft red cheek, marbled darker; flesh white to the stone, delicate; stone ovate and rugged. Ripens at the end of summer. French.

Early Anne. (*Syn.* Green Nutmeg.) Rather small, round; surface greenish white, becoming nearly white, sometimes faintly tinged with red to the sun; flesh white to the stone, sweet, pleasant, with a faint mingling of a vinous flavor. Stone light colored, small, uncommonly smooth. Shoots with a light-green cast. Very early. The tree at the north is very tender, and the young shoots are often winter-killed, which, with its slow growth and deficient productiveness, render it unprofitable for general cultivation. Flowers white. English, old.

MAGDALEN OF COURSON. (*Syn.* Madeleine de Courson, Red Magdalen, True Red Magdalen, French Magdalen, Madeleine Rouge.) Medium size, or rather small, round, slightly oblate, suture deep on one side; surface nearly white, with a lively red cheek; flesh white, slightly red at the stone; juicy, rich, vinous. Rather early, or last two weeks of summer. French, old. The genuine sort is little known in this country.

MALTA. (*Syn.* Italian.) Rather large, roundish, slightly flattened, suture broad, shallow, surface pale dull green, blotched and spotted with dull purple next the sun; flesh greenish, slightly red at the stone, very juicy, melting, rich, with an excellent sub-acid, vinous flavor. Ripens end of summer. A moderate bearer. Shoots slightly liable to mildew. A spurious sort with globose glands, and of inferior quality. has been generally desseminated in this country.

NOBLESSE. (*Syn.* Vanguard, Mellish's Favorite.) Large, round-oblong or oval, slightly narrower at apex, and terminated by a short acute point; skin pale green, clouded and shaded with light dull red to the sun; flesh pale greenish white to stone, very juicy, with a very rich high flavor. Tree of rather slow growth and liable to mildew, the only drawback on the value of this excellent peach. Ripens end of summer and the beginning of autumn. English.

SERRATE EARLY YORK.* (*Syn.* True Early York, Early York of Downing, Early Purple *erroneously*. Size medium, roundish-oval, suture slight; dotted with red on greenish-white in the shade, dark red to the sun; flesh very tender and full of juice, rich, with a faint mingling of acid. Quite early, or middle of 8 mo., (Aug.) Growth rather free for a serrate-leaved peach.—Very productive, and from its earliness, of great value. Differs from the Large Early York by its large flowers, cut-leaves, oval fruit, and earlier maturity.

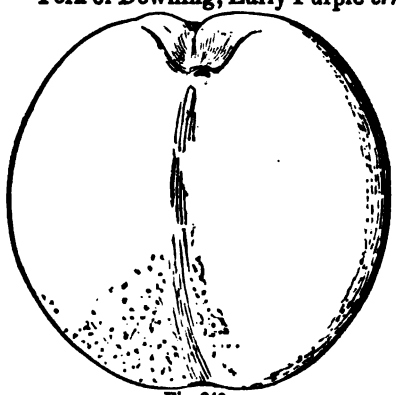


Fig. 240.

* This name has been objected to as consisting of more than two words, but it is much shorter than *Crawford's Early Malocoton* and *White Blossomed Incomparable*, so commonly adopted. It is even as short as the single term *Incomparable*.

Sweetwater. (*Syn.* Early Sweetwater.) Size medium, roundish, light green at maturity, flesh tender, melting, rich, and juicy. It is a seedling from the Early Anne, which it much resembles in growth and general character, but is more than twice its size, superior in flavor, and ripens nearly a week later. A moderate bearer. Like the Early Anne it is too tender for the north, and does not ripen before the Tillotson and Serrate Early York.

The Sweetwater of Downing has globose glands and large flowers, with a roundish, middle-sized, greenish-white fruit; the tree is more hardy than the preceding, but the fruit ripens later, and is inferior in quality.

White Nutmeg. (*Syn.* Early White Nutmeg, Avant Blanche, White Avant.) Very small, roundish oval, with a deep suture on one side; skin nearly white, rarely touched with faint red; flesh white to the stone, with a mild, pleasant flavor. Ripens about mid-summer, or immediately after wheat harvest, and is the earliest and smallest peach cultivated. Its very slow growth, tender shoots, and light crops, render it of little value.

Sub-section II. Flowers small.

Belle de Vitry. (*Syn.* Admirable Tardive.) Size medium, approaching oblate; apex depressed, suture deep; skin nearly white, tinged and marbled with bright and dull red; flesh rather firm, red at the stone, juicy and rich. Quite late, or last of 9 mo. (Sept.) This is quite distinct from the Late Admirable, which ripens two weeks earlier; and from the Early Admirable, often known by the name of Belle de Vitry, and which ripens six weeks earlier. Both of the latter have crenate leaves with globose glands.

Early Tillotson. Size medium; round or nearly globular; thickly dotted with red on a nearly white ground in the shade, dark deep red in the sun; flesh whitish, red at the stone, to which the flesh partially adheres,—juicy, rich, high-flavored, more of a nutmeg and less of a vinous flavor than the Serrate Early York, and ripening about the same time or a few days earlier, or the early part and middle of 8 mo. (Aug.) Its time of maturity is often somewhat variable, even on the same tree. The young

trees are of slow growth, and the leaves liable to mildew. from both of which it gradually recovers as the tree advances in size. Origin, Cayuga Co., N. Y.

Emperor of Russia. (*Syn.* Cut-leaved, Serrated, Unique.) Fruit large, approaching oblate; one half, more swollen; surface rather downy, dull yellowish white, with a dark red cheek; flesh yellowish white, rather firm, rich, high-flavored. End of summer. Although the flavor is first-rate, it is a poor grower and a poor bearer. Origin, New-York.

Royal George. ((*Syn.* Early Royal George.) Rather large, globular, broad and depressed, or inclining to oblate; suture deep at apex, passing two-thirds round the fruit; skin nearly white, thickly dotted with red, with a broad, deep, rich red, slightly marbled cheek; flesh whitish, very red at the stone, juicy and rich. Ripens a week or two before the end of summer. A moderate bearer. Shoots liable to mildew.

Red Rareripe. (*Syn.* Early Red Rareripe, Large Red.) Rather large, globular, broad and depressed; suture broad and deep, passing nearly round the fruit; skin nearly white, with red dots in the shade, and a rich dark red cheek in the sun; flesh, whitish red at the stone, juicy, rich, and high-flavored. Ripens during the last two weeks of summer. Resembles the Royal George, but superior in quality. Both are subject to mildew of the leaves.

Royal Charlotte. Rather large; approaching ovate; base slightly wider than apex; suture moderate; skin pale greenish-white, with a deep red marbled cheek; flesh white, pale red at the stone; juicy, rich, fine. First of autumn.

Section II. Leaves crenate, with globose glands.

Sub-section I. Flowers large.

Acton Scott. Size medium; rather narrow and depressed at apex, suture shallow; skin rather wooly, nearly white, with a marbled, bright-red cheek; flesh pale to the stone, with a rich, sometimes slightly bitter flavor. Early,—mid

dle of 8 mo., August. English; a cross between Noblesse and Red Nutmeg. Rare in this country.

Astor. Large, slightly oblate, apex slightly depressed, suture distinct; surface nearly white, with a deep red cheek; stone small; flesh very juicy, sweet, good second-rate. Ripens end of summer. Origin, New-York.

Barrington. Large, roundish-ovate, apex rather pointed; suture on one side, moderate; skin nearly white, with a deep-red, marbled cheek; flesh slightly red at the stone, juicy, rich, and of high quality. Ripens early in autumn. Does not attain its full flavor north of New-York city. English.

Clinton. Size medium, roundish, apex slightly depressed, suture nearly obsolete; surface nearly white, with a somewhat striped red cheek; flesh juicy, faintly red at the stone, of second-rate flavor. End of summer. American.

Early Admirable. (*Syn.* Admirable; Belle de Vitry, *erroneously.*) Size medium; nearly round; skin nearly white, with a red cheek; flesh red at the stone, juicy, rich, sweet, fine. Quite early, ripening immediately after Serrate Early York. French.

GROSSE MIGNONNE. Large, roundish, slightly oblate; apex depressed, with a deep suture; skin tinged with greenish yellow, mottled with red, and with a purplish red cheek; flesh reddened at the stone, juicy, with a very rich, high, and somewhat vinous flavor; stone small, very rough. Early,—the last two weeks of summer. Of French origin. The peach usually cultivated in this country under this name, although an excellent variety, is not the genuine Grosse Mignonne, but differs in its small flowers.

Sub-section II. Flowers small.

Bellegarde. (*Syn.* Galande, Smooth-leaved Royal George, Violette Hative *of some*, Red Magdalen *erroneously.*) Size medium or large, round, regular; suture shallow, deepest at apex, with a slight projecting point; skin nearly white,

with a faint tinge of green, and a rich red cheek, often streaked darker; flesh slightly red at the stone, a little firm, melting, juicy, rich, and of fine flavor. Stone rather large. End of summer. French.

COLE'S EARLY RED. Size medium, roundish, suture small; skin mostly mottled with red, with dark red on the sunny side; flesh juicy, rich, with a pleasant and fine flavor, hardly first-rate in quality. Valuable for its great productiveness and early maturity, ripening nearly as early as the Serrate Early York. American.

COOLEDGE'S FAVORITE. Rather large or medium; roundish, rather largest on one side; suture distinct at apex; skin nearly clear white, mottled with red dots in the shade, and with a brilliant deep scarlet cheek in the sun; flesh very melting and juicy, with a rich, faintly acid flavor. Ripens about the middle of 8 mo., Aug. Origin, Watertown, Mass.

DRUID HILL. Very large, roundish, cavity rather narrow; suture slight, with a distinct but scarcely prominent point at apex; surface pale greenish white, clouded with red towards the sun; flesh greenish white, purple at the stone, very juicy, with a very rich, high vinous flavor; stone long and rather compressed, much furrowed. Ripens quite late, or latter part of 9 mo., Sept. Growth unusually vigorous. Origin, Baltimore.

Favorite. Large, oblong, or oval; skin rather downy, much covered with red, very dark towards the sun; flesh red at the stone, a little firm, juicy, with a good, vinous, but not rich flavor. Hardy and very productive. Ripens medium or rather late, or about the second week of autumn. Glands of the leaves very small, obscure, or none. American.

Fox's Seedling. Round, slightly compressed, cavity narrow; white with a red cheek; juicy, sweet, good. Season, medium or rather late. New-Jersey.

GEORGE THE FOURTH. Large, round, suture deep and broad, one half slightly larger; skin nearly white in the shade, dotted red, with a deep red cheek, flesh slightly

red at the stone, melting, juicy, rich, excellent. Ripens at the end of summer. Branches rather more diverging than usual; leaves pale green, often glandless. Crops moderate, one cause of its excellence. Origin, New-York.

Green Catharine. Large, round, pale green, with a red cheek, flesh bright red at the stone, tender, juicy, rather acid. Season, rather late, does not ripen richly as far north as the 43d degree of latitude.

LARGE EARLY YORK. (*Syn.* Early York of New-Jersey, Honest John.) Large, roundish, inclining to oblate in fully grown specimens, nearly white in the shade, with red dots, and with a deep red cheek to the sun; flesh nearly white, fine-grained, very juicy, with mild, rich, excellent flavor.

The NEW-YORK RARERIPE, (a name which has been more or less applied to nearly all the early red peaches sent to New-York market,) or Livingston's New-York Rareripe, is usually regarded as identical with the large Early York, but T. Hancock, of Burlington, considers them distinct,—the New-York Rareripe being rather superior, and ripening three days later. Haines' Early Red closely resembles, if it is not identical with Large Early York.

LATE ADMIRABLE. (*Syn.* La Royale, Bourdine, Têton de Venus, Judd's Melting, Motteuxs Late Purple *incorrectly.*) Quite large, roundish, inclining to oval, with a deep suture extending nearly round, and an acute swollen point at the apex; surface pale yellowish-green, with a pale red cheek, marbled with darker red; flesh greenish white, red at the stone, juicy, delicate, flavor excellent. Season rather late. Of French origin.

LATE RED RARERIPE. Large, roundish-oval, apex marked with a depressed suture and sunken point; skin rather downy, pale greyish yellow, spotted and thickly marbled, deep dull red to the sun, and with fawn-colored specks; flesh white, deep red at the stone, juicy, with a very rich and high flavor. The fruit is distinguished by its pe-

culiar *greyish* cast. Season, the first two weeks of autumn. American

Morris' Red Rareripe. Large, roundish, apex slightly depressed, suture moderate, distinct; surface greenish-white, with a bright rich red cheeck; flesh greenish-white, quite red at the stone, juicy, sweet, rich. Season, end of summer. Origin, Philadelphia. Differs from George IV., in its darker leaves, heavier crops, more even fruit, inferior flavor, and in ripening a few days later.

Morrissania Pound. (*Syn.* Hoffman's Pound.) Very large, nearly round; surface dull greenish-white, with a brownish red cheek; flesh pale yellowish, juicy, tolerably rich. Late. Origin, New-York.

NIVETTE. Large, roundish, sometimes slightly oval, suture slight, apex but little depressed; surface light yellowish-green, with a faint red cheek; flesh pale green, varying from pink to deep red at the stone, juicy and melting, and with a very rich flavor. Season medium, immediately preceding or ripening nearly with Morris White, and one of the best of its season for the north. Of French origin.

OLDMIXON FREESTONE. Large, roundish, slightly oval, one side swollen, suture visible only at apex; cavity shallow; surface a pale yellowish white, marbled with red, with a deep red cheek when fully exposed; flesh deep red at the stone, tender, rich, excellent. Season medium, or the first of autumn. Succeeds well in all localities, and has few equals as a variety for the north, to succeed the early peaches.

President. Large, roundish-oval, with little suture; skin very downy, yellowish-white, with a tinge of green, and a dull red cheek; flesh nearly white, deep red at the stone, very juicy, and with a high flavor; stone rough, to which the flesh partially adheres. Ripens a little later than Morris White, or middle of 9 mo., (Sept.)

Scott's Early Red. Medium size, roundish, suture distinct, moderate; skin nearly white, mottled and covered with

red; flesh very juicy, with a rich, fine flavor. Rather early, or end of summer. New Jersey.

VAN ZANDT'S SUPERB. Size medium, roundish, one half larger, suture slight; skin nearly white, with a beautifully dotted red cheek; flesh whitish, tinted with red at the stone, juicy, sweet, of fine pleasant flavor. First of autumn. Origin, Flushing, Long Island.

WALTER'S EARLY. Rather large, roundish; surface nearly white, with a rich red cheek; flesh whitish, touched with red at the stone, juicy, sweet, of fine flavor. Ripens the last week of summer. A native of New-Jersey, and is a valuable peach at the north.

WARD'S LATE FREE. Large, not quite of the largest size, roundish, surface dull yellowish white, with a red cheek, nearly the color of the Oldmixon Free, but not so clear nor bright; flesh nearly white, of excellent flavor. One of the finest late peaches of the middle states. The Reybolds, of Delaware, the most extensive peach raisers in the United States, having reduced their list to about fifteen sorts, have retained this as one of the best late varieties.

Washington. (*Syn.* Washington Red Freestone.) Large, somewhat oblate, with a broad deep suture passing nearly round; skin thin, yellowish-white, with a deep crimson cheek; flesh nearly white, tender, juicy, sweet, rich. Stone small, to which the flesh slightly adheres. Rather late. Origin, New-York.

WHITE IMPERIAL. Rather large, roundish, often slightly oblate, depressed at apex; suture moderate; surface pale yellowish white, often with a faint tinge of green; slightly tinged and sometimes striped with light purple to the sun; flesh very juicy, delicate, sweet, excellent. A uniform moderate bearer, and a valuable peach at the north, but worthless in Virginia. Ripens rather early, or latter part of summer. Origin, Cayuga Co., N. Y.

Section III. Leaves with reniform glands.

Sub-section I. Flowers large.

Early Purple. (*Syn.* Pourpr´e Hâtive, Pourprée Hative à Grand Fleurs.) Size medium, globular, depressed, a deep suture across the apex; skin light yellow, with a mottled purplish red cheek; flesh red at the stone, melting, juicy, with a high flavor; stone broad and rough; season early, or middle or latter part of 8 mo., (Aug.) Rare in this country. The Serrate Early York has been propagated under this name in portions of this country, and the Grosse Mignonne in Europe; from both of which it differs in the glands of its leaves.

White Blossomed Incomparable. (*Syn.* White Blossom, Willow Peach.) Large, oval; skin wholly white; flesh white to the stone, juicy, pleasant, of tolerable flavor. Ripens first of autumn. Flowers white, leaves light green, shoots pale yellow. American.

Sub-section II. Flowers small.

BREVOORT. (*Syn.* Brevoort's Morris, Brevoort's Seedling Melter.) Medium or large, round and slightly oblate, suture distinct, deep at apex; skin nearly white or with a faint dingy hue, with a bright red cheek; flesh rather firm, slightly red at stone, rich, sweet, and high-flavored. First of autumn. Moderately and uniformly productive. Origin, New-York.

Chancellor. (*Syn.* Late Chancellor, Noisette.) Large, oval, suture distinct; skin nearly white, with a dark crimson cheek; flesh deep red at the stone, with a rich vinous flavor; stone oblong. Late. Of French origin.

Early Newington Freestone. Size medium; roundish, one half always larger, suture distinct; surface nearly white, dotted and streaked with red, the cheek a rich red; flesh white, red at the stone, at first wholly adhering, but as it ripens, partially separating from it; juicy, rich, fine. A valuable early variety, ripening immediately after the Serrate Early York.

Kenrick's Heath. (*Syn.* Freestone Heath.) Very large, oblong, suture slight, apex pointed; surface pale greenish-white, with a purplish red cheek; flesh deep red at the stone, rather coarse, very juicy, sub-acid, second-rate, sometimes third-rate; when well grown on some localities, it proves a good sub-acid peach. Season, medium or rather late. New-England.

La Grange. Large, oblong; surface pale greenish-white, rarely tinged with red by the sun; flesh juicy, with a rich, fine flavor. Quite late. Origin, Burlington, N. J., and does not attain a fine flavor much farther north.

Morris White. (*Syn.* Morris' White Rareripe, White Rareripe, Lady Ann Steward.) Rather large, roundish, or roundish-oval, often obscurely obovate or a little larger towards the apex, suture small; surface rather downy, of a pale creamy white at maturity, rarely tinged with purple to the sun; flesh slightly firm, wholly white, very free from the drab stone, melting, juicy, with a good, rich flavor; hardly of the highest quality at the north, better in the middle states; very popular everywhere. Season, medium, or early in autumn.

Cole's White Melocoton, as usually cultivated, is a synonym; but when genuine, is quite distinct, according to T. Hancock, being larger, heavier, and rounder, and ripening two weeks later.

Snow. Large, globular, suture distinct only at apex; skin thin, wholly white; flesh white to the stone, juicy, sweet, rich. First of autumn. Very variable; sometimes worthless for the table; always a fine peach for preserving.

Strawberry. (*Syn.* Rose.) Size medium, oval, cavity deep, suture passing half round; surface mostly marbled with deep red; flesh whitish, melting, rich, of fine flavor. Early.

Class II. Flesh deep yellow.

Section I. Leaves crenated, with globose glands.

Sub-section I. Flowers large.

Baltimore Beauty. Rather small, round-oval; skin deep orange, with a bright red cheek; flesh yellow, red at the stone, sweet, good, mealy when over-ripe. Quite early. Origin, Baltimore, where it is good, but it proves of third-rate quality at the north.

Sub-section II. Flowers small.

Crafword's Early. (*Syn.* Early Crawford, Crawford's Early Melocoton.) Very large; oblong-oval, sometimes round-oval; apex with a prominent point; suture shallow; surface yellow, with a red cheek; flesh very juicy, rich, slightly sub-acid, of good but not the highest flavor. End of summer and beginning of autumn. Productive. Ranks very high in the northern, middle, and western states, as a market variety. Origin, New-Jersey.

Crawford's Late. (*Syn.* Crawford's Late Melocoton, Crawford's Superb Melocoton.) Very large, roundish, suture shallow, distinct; surface yellow, with a broad, dark red cheek; flesh red at the stone, rich, juicy, vinous, hardly first-rate. Quite late, or latter part of 9 mo. (Sept.) Productive; and ranks among the first as a late variety for market. Origin, New-Jersey. The common Red Cheek Melocoton is cultivated in some localities under this name.

Jaques' Rareripe. Very large, roundish, slightly oblate, suture distinct, one side slightly larger, surface a little uneven; surface deep yellow, variously shaded with red; flesh deep yellow, red at the stone, of good but not of the highest flavor. Shoots diverging. Ripens at the end of summer. Origin, Mass.

*Red-Cheek Melocoton.** Large, roundish-oval, with a point at apex; surface yellow, with a deep red cheek; flesh

* Pronounced Mel-o-co-toon, and often written Malacatune and Melocotoon, with other variations in orthography. It is the Spanish name for peach.

red at the stone, juicy, with a good, rich, vinous flavor, not of first-rate quality. Ripens rather late, or during the last half of 9 mo., (Sept.,) in the middle states about the first of autumn. Extensively cultivated as a market peach.

Scott's Nonpareil. Large, roundish, slightly oblong, surface deep yellow with a red cheek, resembling Crawford's Late, but sweeter. Origin, Burlington, N. J., where it ripens about the 12th of 9 mo., (Sept.) New.

Yellow Alberge. (*Syn.* Purple Alberge, Yellow Rareripe, *erroneously.*) Size medium; roundish, suture distinct, passing half round; skin yellow, with a deep purplish red cheek; flesh deep red at the stone, juicy, sweet, pleasant, of second-rate flavor.

This is distinct from the Early Barnard or Alberge of western New-York, a sub-variety superior to the original. The Rosanna, another sub-variety, ten days later, and with reniform glands, is cultivated in some localities under the name of Yellow Alberge.

Yellow Rareripe. Large, roundish; suture moderate, passing half round; apex with a small point; surface deep orange, somewhat dotted, with a rich red cheek, shaded off in streaks; flesh red at the stone, juicy, rich, fine; of nearly first-rate quality; stone small. End of summer, and first of autumn. One of the best yellow peaches. There are several spurious and inferior sub-varieties.

Section II. Leaves with reniform glands.

Sub-section I. Flowers large.

Yellow Admirable. (*Syn.* Abricotée; Admirable Jaune, Orange Peach, Apricot Peach.) Large, roundish-oval, suture small, and on one side only; surface wholly yellow, or faintly reddened next the sun; flesh slightly red at the stone, firm, and rather dry; flavor sweet and agreeable; stone small; season, very late. Of French origin

Sub-section II. Flowers small.

BERGEN'S YELLOW. Very large, round, slightly oblate; suture distinct, passing more than half round; surface deep orange, with a broad deep red cheek; flesh juicy, rich, excellent. Ripens the first of autumn. This is perhaps the finest of all yellow-fleshed peaches. Origin, Long Island, N. Y.

It differs from the Yellow Rareripe in its more oblate form, darker color, superior flavor, and later maturity, and in its reniform glands.

COLUMBIA. Large; roundish-oblate; suture distinct, passing half way round; skin rough, rather thick, dull dingy red, with spots of darker red; flesh yellow, rich, juicy, of excellent flavor. Origin, New Jersey. Ripens early in autumn. Shoots dark reddish purple.

DIVISION II. CLINGSTONES OR PAVIES.

CLASS I. FLESH, PALE OR LIGHT COLORED.

Section I. Leaves serrated, without glands.

Sub-section I. Flowers large.

Old Newington. (*Syn.* Newington, Large Newington.) Large, roundish, suture slight; surface nearly white, with a fine red cheek, somewhat streaked with darker red; flesh nearly white, deep red at the stone; somewhat melting, juicy, rich. Season, rather late, or middle of 9 mo. (Sept.)

A sub-variety, cultivated to a considerable extent in this country, has *globose glands*.

Smith's Newington: (*Syn.* Early Newington.) Size, medium; roundish-oval, narrower at apex, one side slightly enlarged; surface pale yellow, with a lively red cheek, streaked with purple; flesh bright red at the stone, juicy, good. Ripens end of summer.

This is of English origin, and is quite distinct from the Early Newington Freestone, a *melting* (not *firm-fleshed*) peach, often adhering to the stone.

SECTION II. LEAVES CRENATE, WITH GLOBOSE GLANDS.

Sub-section I. Flowers small.

LARGE WHITE CLINGSTONE. Large, round, suture slight, point at apex small; skin white, dotted with red, or with a light red cheek next the sun; flesh very juicy, sweet, rich, and high-flavored. Season, early in autumn. Origin, New-York.

OLDMIXON CLINGSTONE. Large, roundish-oval, suture distinct only at apex, fruit slightly larger on one side; surface yellowish white, dotted with red, or with a red cheek; flesh juicy, rich, with a high flavor. Ripens first of autumn. This is one of the finest of clingstone peaches.

SECTION III. LEAVES WITH RENIFORM GLANDS.

Sub-section I. Flowers small.

Catherine Cling. Large, roundish-oval, swollen most on one side, with a small point at apex; surface pale yellowish-green, thickly dotted and with a cheek of red, with darker streaks; flesh firm, dark red at the stone, juicy, rich, fine. Season, late. Of English origin. The fruit of this variety, and of the Old Newington, and Oldmixon Cling, considerably resemble each other, but all differ in the glands of the leaves.

HEATH. (*Syn.* Heath Cling, White Heath.) Very large, oblong-oval, the largest specimens nearly round, with a large, conspicuous point at the apex; suture distinct on one side; surface quite downy, pale yellowish white, sometimes faintly tinged with red next the sun; flesh exceedingly juicy, becoming melting, with a sweet, very high, rich, and excellent flavor; leaves large, wavy, deep green, slightly crenate. Season, very late, about mid-autumn, and the fruit may be kept nearly till winter. At the north, it matures fully in the warmest seasons only; and never attains its full size, which is about three inches in diameter, unless much thinned on the branches, to effect which a thorough shortening-in is by far the best mode. Origin, Maryland. Tree quite hardy and vigorous. In southern Virginia, the Heath is rather an un-

certain peach, but when perfect it ripens there the first fortnight in autumn.

Incomparable. (*Syn.* Pavie Admirable.) Large, roundish, one side enlarged; skin nearly white, light red to the sun; flesh red at the stone, juicy, agreeable, second-rate. Ripens late. Resembles the Catherine, but larger, later, and of inferior quality.

Class II. Flesh deep yellow.

Section I. Leaves serrate, without glands.

Sub-section I. Flowers small.

Orange Clingstone. Large, round, suture distinct, passing nearly round, with no point at the apex; surface deep orange, with a dark red cheek; flesh rather firm, rich, juicy, vinous. Season, early in autumn.

Section II. Leaves with reniform glands.

Sub-section I. Flowers small.

Lemon Clingstone. (*Syn.* Kennedy's Cling, Pine Apple Cling, Yellow Pine Apple.) Large, oblong-oval, slightly narrowed at apex, terminated by a large prominent point; surface deep yellow, with a dark brownish-red cheek; flesh firm, slightly red at the stone, with a rich, vinous, sub-acid flavor. Quality about second-rate. Rather late. Tree productive, hardy. Origin, South Carolina.

Late Yellow Alberge. *Syn.* Algiers Winter, October Yellow.) Size medium; roundish-oval; suture small, distinct; skin quite downy, green becoming yellow; flesh yellow to the stone, very firm, of second-rate quality. Ripens very late, or about mid-autumn. French.

Tippecanoe. Large, nearly round, slightly compressed; surface yellow, with a red cheek; flesh yellow, juicy, vinous, good. Quite late. A native of Philadelphia; of little value much further north. New.

Washington Clingstone. Size medium; roundish; surface yellowish-green, with gray specks, and with a slight

tinge of red to the sun; not handsome; flesh very tender, sweet, high-flavored. Quite late.

CLASS III. FLESH PURPLISH CRIMSON.

Section I. Glands reniform.

Sub-section I. Flowers small.

Blood Clingstone. (*Syn.* Claret Clingstone, Blood Cling.) Large, often very large, roundish-oval, suture distinct; skin quite downy, dark, dull, clouded, purplish-red; flesh deep red throughout, firm, juicy, only valuable for culinary purposes.

The French Blood Clingstone, the parent of the preceding, only differs from it in its smaller size and large flowers.

The Blood Freestone is much smaller, and of no value.

NECTARINES.

The Nectarine being nothing more than the peach with a glossy skin, the same rules for cultivation will apply equally to both, with the exception that its smooth surface renders it eminently liable to the attacks of the curculio. For the remedies, see the chapter on the Plum.

The nectarine is usually inferior, and has more of the *noyau* flavor than the peach; and the shoots are of smoother and more compact growth.

DIVISION I. FREESTONES.

CLASS I. FLESH PALE.

Section I. Leaves with reniform glands.

Sub-section I. Flowers large.

NEW WHITE. Rather large, nearly round; skin white, often a slight tinge of red; flesh white, tender, juicy, rich, vinous; stone small. Season medium or first of autumn. English.

The *Old White* resembles the preceding, but is less hardy and productive.

Sub-section II. Flowers small.

DOWNTON. Medium in size, roundish-oval, pale green, with a deep violet-red cheek; flesh pale green, slightly red at the stone; melting, rich, excellent. Ripens end of summer. This is perhaps the best flavored of all the nectarines. English.

Duc de Telliers. Rather large, roundish-oblong, apex slightly narrowed, base broad; pale green, with a marbled purple-red cheek; flesh pale red at the stone, juicy, sweet, good. Rather early, or end of summer.

EARLY VIOLET. (*Syn.* Violet Hative, Aromatic, New Scarlet, Large Scarlet, Early Brugnon, Violet Musk, Violette Musquée.) Size medium; roundish, apex slightly narrowed, suture shallow; skin with a dark purple red cheek and brown dots, on pale yellowish-green; flesh whitish, much reddened at the stone; stone roundish, moderately rough, reddish or reddish brown; flesh melting, rich, high-flavored, and aromatic; of the finest quality. Season medium or end of summer. Distinguished from Elruge by its redder flesh and stone, and darker skin.

The LARGE EARLY VIOLET, or VIOLETTE GROSSE, differs in its larger size and rather inferior flavor.

ELRUGE. Medium in size, roundish-oval; suture slight, distinct at apex; skin a dark red or deep violet on a greenish-yellow ground, with minute brownish dots; flesh greenish-white, slightly, sometimes scarcely stained with pale red at the stone; juicy, rich, high-flavored; stone rough, pale. Season about medium, or first of autumn. This is one of the best and most celebrated of nectarines.

HARDWICKE SEEDLING. Large, roundish, approaching oval, resembling Elruge.; skin with a violet-red cheek on pale green; flesh greenish-white, slightly reddened at the stone, juicy, rich, high-flavored. Season, medium, or end of summer. English, new.

Murrey. Size medium, roundish-ovate, one side slightly larger, skin with a dark red cheek on pale green; flesh

greenish-white, sweet, good ; stone nearly smooth. Rather early. Unproductive. English, old.

Peterborough. Rather small, roundish ; skin nearly green, with a slightly dingy red cheek; flesh greenish-white to the stone, flavor tolerable. Very late, or nearly mid-autumn. Valueless. The sort usually propagated under this name in this country, although a superior sort, is not genuine.

Class II. Flesh deep yellow.

Section I. Leaves serrate, without glands.

Sub-section I. Flowers small.

Hunt's Tawny. Nearly medium size, roundish-ovate, narrowed and pointed at apex, one side slightly enlarged ; skin, a dark red cheek on pale orange, with numerous russet specks ; flesh deep orange, rich, juicy, good. English. Valuable for its early maturity, ripening quite early, or three weeks before the close of summer.

Section II. Leaves with reniform glands.

Sub-section I. Flowers small.

Boston. (*Syn.* Perkins, Lewis.) Large, handsome, roundish-oval ; bright yellow, with a deep red cheek ; flesh yellow to the stone, with a good, pleasant, but not very high flavor. Season, medium, or about the first of autumn. A native of Boston.

Fairchild's. Small, round, slightly flattened at apex ; skin a bright red cheek on yellowish green ; flesh yellow to the stone, rather dry, flavor poor. Quite early, its only merit.

Pitmaston's Orange. Large, roundish-ovate, base broad, apex narrow and pointed ; surface with a dark reddish cheek, slightly streaked at the margin, on rich orange ; flesh deep yellow, red at the stone ; juicy, rich, fine ; stone rather small. Rather early.

DIVISION II. CLINGSTONES.

Class I. Flesh Pale.

Section I. Leaves serrate without glands.

Sub-section I. Flowers large.

Early Newington. (*Syn.* Black, Early Black, Lucombe's Seedling.) Large, roundish-ovate, one side slightly enlarged, apex pointed; skin pale green, nearly covered with bright red and with darker marblings and dots; flesh greenish-white, deep red at the stone, juicy, with a fine rich flavor. First of autumn.

Newington. (*Syn.* Scarlet Newington, Scarlet, Old Newington, Smith's Newington, Anderson's.) Rather large, roundish; nearly covered with red and darker marblings, on pale greenish-yellow; flesh deep red at the stone, juicy, rich, vinous. Rather late. Best when ripened to shrivelling.

Class II. Flesh yellow.

Section II. Leaves with reniform glands.

Sub-section I. Flowers large.

Red Roman. (*Syn.* Roman, Old Roman, Brugnon Musquée.) Large, roundish, a little flattened at apex; skin greenish-yellow, with a somewhat rough, dull reddish-brown cheek, with brown russet specks; flesh firm, greenish-yellow, deep red at the stone, rich, vinous, high-flavored. Season medium or rather late.

Sub-section II. Flowers small.

Broomfield. Large, roundish; skin with a dull red cheek on dull yellow; flesh yellowish; flavor tolerable. Rather late. Origin, Harvard, Mass.

Golden. (*Syn.* Orange, Fine Gold-Fleshed.) Medium in size, roundish-ovate, handsome; surface bright waxen yellow, with a small scarlet cheek; flesh firm, of rather poor flavor. Cultivated only for its beauty. Rather late.

Prince's Golden Nectarine resembles this, but is larger, a week later, and has large flowers.

CHAPTER V.

THE APRICOT.

It is remarkable that a fruit of such excellence as the apricot, and ripening from one to two months before the best early peaches, should be so little known. In its natural character, it is more nearly allied to the plum than the peach, resembling the former in its broad leaf, and in the smooth stone of its fruit; but downy like the peach, and partaking largely of its flavor and excellence.

The apricot is budded on seedling apricots, and on peach and plum stocks. Plum stocks are preferred, and are more especially adapted to heavy soils. On light soils, the hard-shelled almond, and the wild plum, have proved excellent.

The soil should be deep and dry. Young trees have frequently perished from a wet sub-soil, even where the surface was not unusually moist. A mistaken notion prevails as to the hardiness of the apricot. On suitable soils, it is as hardy as most early peaches. This mistake has however arisen from other causes. The tree has been commonly planted in the warmest situations, as on the warm side of buildings, or other sheltered site, facing the hot sun, where they have blossomed early, and as a consequence, the crop has not unfrequently been destroyed by vernal frosts. Hence, a northern or more exposed aspect, would be far preferable. If trained on a building, the eastern side should be especially avoided, as a hot morning sun upon frosted buds would be nearly certain destruction.

The liability to the attacks of the curculio, and the very common destruction of the whole crop by this insect, has led to the erroneous conclusion that the apricot is not suited to our northern climate. Several cultivators, as far north as forty-three degrees of latitude, by a systematic destruction of this insect, obtain annually heavy crops of this delicious, golden, mid-summer fruit. The mode of protection is fully described in the chapter on the Plum.

VARIETIES.

Class I. Stone with a sweet kernel.

Section I. Medium in size.

Orange. (*Syn.* Early Orange, Royal Orange, Royal George, Persian, Royal Persian.) Size medium; roundish; suture distinct, deep at base; surface orange, often a ruddy cheek; flesh dark orange, half dry, partly adhering to the stone—dry and poor unless house-ripened. Stone small, roundish. Culinary. Ripens at mid-summer.

Turkey. Size, medium; round, not compressed; surface deep yellow, with a mottled brownish orange cheek; flesh pale yellow, firm, juicy, with a fine mixture of sweet and acid; very free from stone. Rather late, or middle of S mo., Aug. Somewhat resembles Moorpark, but differs in being rounder, paler, with an impervious stone, and sweet kernel.

The Blotch-leaved, or Golden Blotched, is identical with the preceding, with a yellow spot on the centre of each leaf.

Section II. Small.

BREDA. (*Syn.* Holland, Amande Aveline.) Rather small, sometimes nearly medium, (an inch and a half diameter,) roundish, obscurely four-sided, suture distinct; surface orange, with a dark reddish orange cheek; flesh deep orange, free from the stone, rich and high-flavored. Quite early, or a week or two after mid-summer. Hardy for an apricot, and very productive.

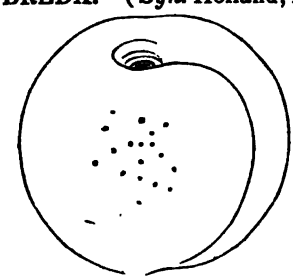


Fig. 241. *Breda.*

Black. (*Syn.* Purple Apricot, Noir, Violet.) Small or medium; round; pale red where densely shaded, dull

deep purple or nearly black in the sun; surface with a thin down; flesh red near the skin, yellowish at the stone; flesh somewhat fibrous, sweet, slightly astringent, with a pleasant, good, second-rate flavor. Adheres to the stone. Hardy as an apple tree, and very productive. A distinct species (*A. dasycarpa*) from the other apricots. Ripens with the Breda. Reproduces itself from the stone. Shoots quite slender, greenish.

There is another quite different apricot, called Violet or Red Angoumois; small, oblong, lighter red, free from the stone. Rare.

Early Golden. (*Syn.* Dubois' Apricot.) Small, an inch and a fourth in diameter; round-oval, nearly smooth, suture narrow, distinct; surface wholly pale orange; flesh orange, moderately juicy, sweet, good, free from the stone. Early, or ten days before the Moorpark. Hardy, very productive, profitable for market. Origin, Dutchess county, N. Y.

Musch. (*Syn.* Musch-Musch.) Rather small, round, deep yellow, with a slight orange red cheek; flesh yellow, translucent, tender, sweet. Tree rather tender. Little known in this country. Origin, Musch, in Asia Minor.

Class II. Stone with a bitter kernel.

Section I. Fruit large.

HEMSKIRKE. Large, roundish, compressed; surface orange, with a red cheek; flesh bright orange, rich, juicy, sprightly. Stone rather small. Resembles Moorpark, but smaller, a little earlier, and stone not perforate. English. Rare in this country.

MOORPARK. (*Syn.* Anson's, Dunmore's Breda, Temple's.) Large, (two inches in diameter,) nearly round, slightly compressed; surface orange, with a deep orange red cheek, and with numerous darker dots; flesh free from the stone, bright yellowish orange, rather firm, quite juicy, with a rich, high flavor. Stone perforate, or with a hole lengthwise under one edge, so that a pin may be thrust through. Season medium, or two weeks after mid-summer. Requires the shortening-in pruning recommended for the peach. English. Old.

PEACH. (*Syn.* Anson's Imperial, Péche, De Nancy.) Very large, slightly larger than Moorpark; yellowish orange, with a brownish orange cheek, and mottled with dark brown to the sun; flesh a rich yellow, juicy, with a rich, high flavor. Stone perforate. Ripens about the time of the Moorpark, which it closely resembles, but is of larger size. Origin, Piedmont.

ROYAL. Rather large, round-oval, slightly compressed, suture shallow; dull yellow, faintly reddened to the sun; flesh pale orange, firm, juicy, sweet, high-flavored, slightly sub-acid, free from the large, oval, nearly impervious stone. Ripens a week before Moorpark, smaller than the latter, and with a less bitter kernel. French. Rare in this country

Shipley's. (*Syn.* Blenheim.) Large, oval, surface orange, flesh deep yellow, juicy, rather rich; stone roundish, not perforate. Inferior to Moorpark, but rather earlier. English. New.

Section II. Medium in size.

Brussels. Size medium; rather oval, compressed; pale yellow, dotted white in the shade, russety brown to the sun; suture deep at base; flesh yellow, rather firm, moderately rich. Rather late.

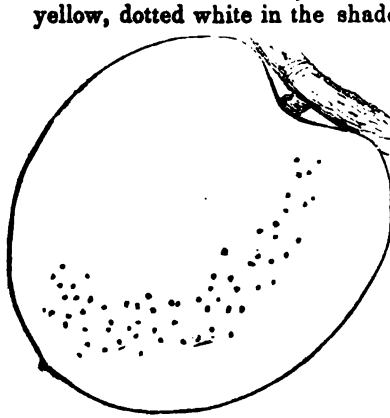


Fig. 242. *Large Early.*

LARGE EARLY.— Size medium; oblong, compressed; suture deep; slightly downy; pale orange, with a spotted bright orange cheek, very handsome; flesh free from the stone, pale orange, rich, juicy. Ripens at or a little before mid-summer. Origin, south of France.

ROMAN. (*Syn.* Abricot Commun.) Medium in size, rather oval, compressed, suture small or obscure; surface pale yellow, with a few red dots to the sun; flesh very fine-grained, half juicy, with a mild pleasant flavor. Worthless in England, but greatly improved by our warm summers. Productive. Season, rather early or medium, or two weeks after mid-summer. It is disseminated in this country under various erroneous names.

The Blotch-leaved Roman differs only in the yellow spot or stain of its leaves.

Section III. Small.

A. berger. (*Syn.* Alberge.) Small, roundish, slightly compressed, deep yellow, flesh reddish, firm, with a rather brisk flavor; stone compressed. Rather late. Leaves with stipules. For preserving.

Red Masculine. (*Syn.* Early Masculine, Brown Masculine, Abricotin, Abricot Precoce, Abricotier Hatif.) Small, nearly round, suture distinct; bright yellow, with deep orange cheek and red spots; flesh yellow, slightly musky, sub-acid; stone thick, obtuse at ends. Flowers rather small. Very early or about mid-summer. Hardy, for an apricot. Valuable only for its earliness.

White Masculine. (*Syn.* White Apricot, Early White Masculine, Abricot Blanc.) Small, roundish, nearly white, rarely a faint reddish cheek, rather downy; flesh white, delicate, a little fibrous, adhering to the stone. Closely resembles the Red Masculine, except in color and being rather better, and four or five days later.

CHAPTER VI.

THE PLUM.

Raising the Young Trees. The plum is propagated by budding or grafting on seedling plums. For this purpose, the stones of such varieties should be chosen, as are of large and thrifty growth; and they are to be treated in planting precisely as directed for the peach, with additional care to prevent the drying of the stones, which much sooner takes place in consequence of their smaller size and thinner shell. If not cracked, a part only will vegetate the first year, although many may be made to open by the repeated action of freezing and thawing.

On light or unfavorable soils, most of the common varieties produce feeble and slowly growing seedlings; an excellent substitute will be found in the larger sorts of the wild plum, sometimes known as the Canada plum, (*Prunus Americana.*) Those varieties which are found to outgrow this stock, should be worked at the surface of the ground, and when transplanted the place of union should be set a few inches lower.

Grafting, to succeed best, should be done quite early in spring, before the buds have commenced swelling; and budding must be performed while the stocks are at the period of their most vigorous growth, provided sufficiently matured buds can be procured, which is usually soon after mid-summer. If deferred, the bark will not peel freely, and the buds will not adhere.

For dwarfs, seedlings of the Mirabelle plum are chiefly used for stocks.

On light soils, the peach has been occasionally used as stocks for plum trees. A very few varieties take readily and grow freely, and large healthy trees have in some instances been produced; but the great uncertainty which attends its

use, and the failure with most varieties, indicate the propriety of the rejection of the peach for this purpose.

The time required to attain a sufficient size for the orchard, varies much with different sorts. The Imperial Gage, the Washington, Huling's Superb, and others, grow rapidly, and usually produce good trees in two years from the graft or bud; while such slow-growing plums as the Primordian, Green Gage, and Red Diaper, require a much longer period.

Soil. The best soil, usually, is a strong, rich, moderately moist, clayey loam. On many light soils the tree grows with less vigor, independently of which the crop is more frequently destroyed by the curculio, a pervious soil affording a more ready place of shelter for the young insects, on their escape from the fallen fruit. A few varieties are well adapted to rather dry as well as light lands.

One of the best manures for the plum, as well as for the quince, is common salt. For large-sized trees, half a peck may be applied annually early in spring; spread to a distance round each tree quite as far as the extent of the branches; smaller trees should receive a proportionate quantity, or just enough to cover the ground equally thick. This application has been found to add to the thriftiness of the tree, to lessen the tendency to leaf-blight, and in some instances it has contributed to the repulsion of the curculio.

In planting orchards, a suitable distance is one rod apart, giving 160 to the acre. The ground should be manured and kept well cultivated, as the plum, especially when young, is very sensitive to the effects of the weeds and grass of neglected culture.

DISEASES AND ENEMIES.

The chief are the curculio, and the black excrescences on the limbs.

The *curculio*, represented in the annexed figure, (243,) is a small insect not more than a quarter of an inch long, of a dark brown color, the sheaths covering the wings slightly variegated with lighter colors, the body resembling in size and appearance a ripe hemp seed. It is distinguished by an elongation of the head, resembling a conspicuous rostrum or beak projecting from the front part of its thorax.

Fig. 243.

About the time the young fruit attains the size of a pea, the curculio begins its work of destruction. It makes a small crescent-shaped incision in the young fruit, and lays its egg in the opening. The presence of the egg may be easily detected by these incisions upon the surface; the annexed figure, (244,) represents one of these magnified twice in diameter. The egg soon hatches into a small white larva, which enters the body of the fruit and feeds upon it, causing, usually, its premature fall to the ground.

Fig. 244.

The period at which the young fruit falls, after being punctured, varies with its age at the time of the injury. The earlier portions drop in about two weeks; but if the stone is hard when the egg is laid, the fruit remains till near the usual period of ripening, sometimes presenting a fair and smooth exterior, but spoiled by the worm within.

The insect, soon after the fall of the fruit, makes its way into the earth, where it is supposed to remain till the following spring, when it is transformed into the perfect insect or beetle, to lay its eggs and perpetuate its race. Instances, however, have occurred, where the transformation has taken place within twenty days of the fall of the fruit.

The curculio travels by flying, but only during quite warm weather, or at the heat of the day. The insects mostly confine themselves to certain trees, or to the same orchard. But the fact that newly bearing and isolated orchards are soon attacked, clearly shows that in occasional instances they must travel considerable distances. Indeed, they have been known to be wafted on the wind for a half mile or more, the windward side of orchards being most infested, immediately after strong winds from a thickly planted plum neighborhood. In the cool of the morning, they are nearly torpid, and can scarcely fly, and crawl but slowly; hence, at this time of the day they are most easily destroyed.

Their flight appears to be never more than a few feet from the ground, and successful attempts have been made to shut them out of fruit gardens by means of a tight board fence, nine or ten feet high, entered by a tight gate.

The remedies for the curculio are various. They are of three distinct methods; *the first*, repelling or excluding

them, as by a tight fence, or by a heap of fermenting manure; *the second*, the direct and immediate destruction of the insects while in the act of depositing their eggs; and *the third*, the destruction of the young larva or worm in the injured fruit to save the next season's crop.

1. It has been found that the effluvia from fermenting manure effectually repels the curculio. Trees standing near stable-cleanings usually bear full crops, and heaps of fermenting manure placed for this purpose beneath the trees, have yielded the same successful result. But other offensive substances, as strong tobacco water with whale-oil-soap, applied so abundantly as to coat thickly the young fruit, has not deterred them in their attacks. In addition to these means, the frequent passing near trees planted by door-paths and other frequented places, and the presence of swine in orchards, doubtless contribute to some extent towards the same end, by frightening the insects away.

2. Destruction of the insects while stinging the fruit is thoroughly effectual, if vigorously and unremittingly applied. The best and indeed only practicable mode, is to jar them from the tree upon white sheets spread beneath. While lying upon the sheet they may not at the first glance of an unpracticed eye be distinguished from the fallen, withered blossoms; but a moment's attention will quickly remove this difficulty. If the sheets are stiffened by means of a light frame, they may be carried by a single person and placed readily beneath the tree. A very large, coarsely made umbrella, covered with white muslin, with a slit in one side, two-thirds in to receive the trunk of the tree, has been found very convenient for young or moderate-sized trees, the umbrella being spread in an inverted position, as exhibited in the an-

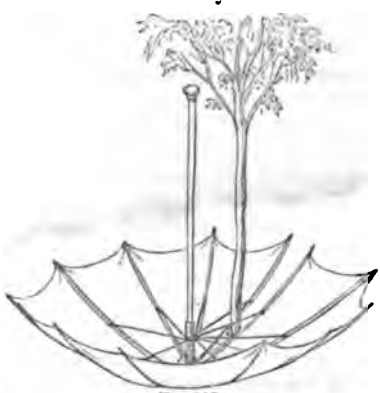


Fig. 245.

nexed figure,(245,) and as soon as the insects are jarred down upon it, it is half closed and shaken, when all its contents roll to the centre and fall through a hole, three inches in diameter, into a vessel of hot water carried for this purpose. Such an umbrella may be procured at the manufacturers, six or seven feet in diameter, for about three dollars, and will save a large amount of labor. Next to this in convenience, are double square frames covered with white muslin, shutting together like the leaves of a book, and enable the operator to throw all the fallen insects into hot water at one movement of the hands.

A quick and sudden jar is important, and may be given by the stroke of a mallet, upon the short stump of one of the smaller limbs, sawed off for this purpose, and which prevents bruising the bark. Or a mallet may be thickly covered with woolen cloth encased in India rubber, to prevent injury to the tree; but the jar is less sudden in this case. David Thomas, (who first proposed jarring down on sheets,) in a communication to the Genesee Farmer, in 1832, says, "Not three days ago, I saw that many of the plums were punctured, and began to suspect that *shaking* the tree was not sufficient. Under a tree in a remote part of a fruit garden, having spread the sheets, I therefore made the following experiment: On *shakimg it well*, I caught *five* curculios; *on jarring it with the hand*, I caught *twelve* more; an on *striking the tree with a stone*, *eight* more dropped on the sheets. I was now convinced that I had been in an error; and calling in the necessary assistance, and using a hammer to jar the tree violently, we caught in less than an hour, more than two hundred and sixty of these insects." With large trees, it may be necessary to shake each limb separately, by means of a pole with the woolen and india-rubber knob, already described, at its extremity.

The best time for this work is in the cool of the morning, when the insects are partly torpid with cold, and drop quickly. At mid-day they retain their hold more tenaciously, and more quickly escape. The work should be commenced very early in the season, as soon as the fruit begins to set, or is not larger than a small pea. With properly stiffened muslin frames, a few minutes are sufficient for many trees,

and labor equal in the aggregate to that of a single entire day, may save large and valuable crops.

3. The third class of remedies includes the different means of destroying the fallen fruit, as soon as it drops, and before the larvæ escape to the earth. One of these consists in beating the ground smooth beneath the tree, sweeping up the fallen fruit daily, and feeding it to hogs or otherwise destroying it. Paving with brick, by preventing the entrance of the insects into the ground, effects the same purpose. If the soil is hard clay, beating the surface, renders it nearly as compact as a pavement. Hence, the reason why the plum crop more frequently escapes in clayey regions, than on lighter soils, where the insect makes its way more easily into the earth.

But more effectual than the last, is the *confinement of swine* beneath the trees. They immediately pick up and destroy the punctured fruit, and by their constant presence, serve to frighten away the insects from their work of destruction. Experience has thoroughly established the efficiency of this method, where a sufficient number of swine has been allowed the run of the orchard. Geese and hens are, to a limited extent, useful in repelling or destroying the curculio.

To apply this remedy most efficiently, all the trees of the apricot, nectarine, and plum, should be planted apart from the rest of the orchard, so that swine may be exclusively confined among them, where they should be allowed to remain the whole season, except during the period of the ripening of the fruit. It will be quite necessary, however, to protect all the younger trees, by encasing them in board boxes, or by tying round them a mass of sweet-briar limbs or other densely prickly or thorny plant.

Dr. Kirtland says, "This insect, last season, [1848,] destroyed every plum on my farm, except the crop of one tree in my swine lot; that tree is bending under its load of fruit." A cultivator in western New-York, by the large number of hogs kept in his plum yard, had abundant crops for more than twenty successive years, while his neglectful neighbors lost the greater part of theirs. It may, however, happen, in thickly planted neighborhoods, that swine may not prove a sufficient protection; but we know of no in-

stance whatever, where abundant crops have not been obtained by combining the two remedies of swine and jarring down the insects.

The curculio appears to prefer the nectarine to all other fruit for the lodgment of its eggs, and next to this the plum and apricot. A large portion of the cherry crop is frequently more or less injured, and sometimes wholly destroyed; and for this reason it may usually be expedient to give it the benefit of the protection of swine in the same enclosure with other smooth stone fruit. The peach is sometimes attacked, but only the very early nutmeg varieties wholly destroyed. Some varieties of the apple are much stung, as indicated by the crescent-shaped incisions; but the larvæ rarely reach so far as the core, and usually perish within the flesh of the fruit.

Among the various remedies which have been tried and proved partial or entire failures, may be mentioned the application of salt to the ground, beneath the tree, and its direct application to the fruit; syringing tobacco water over the fruit and leaves; hanging bottles of sweetened water in the branches to catch the insects, and placing white-washed boxes with water in the bottom during the night, with a lamp within each, to decoy them;* and inverting the soil with a spade late in autumn to expose them to the frosts of winter.

The *black excrescences* on the shoots and limbs, fig. 246, known as the *black knot*, *black gum*, and *warts*, are variously supposed to be the work of an insect, or the result of diseased sap or cells, or regarded as a sort of vegetable ulcer. They have been by some attributed to the curculio, an opinion originating from the occasional detection of this insect within the pulpy excreseences, but entirely disproved by the facts that the curculio has existed in vast numbers in neighborhoods where the excrescences are unknown; and on the other hand, that the excrescences have ruined trees in places not infested with the curculio; besides which, the most rigid search of newly forming knots has failed to detect the eggs or larvæ

Fig. 246.

* Which, however, prove very efficient means of destroying many other insects injurious to fruits and fruit trees.

of the curculio, which are only occasionally found when deposited at a later stage in the large pulpy swellings.

Others, with more plausibility, believe the disaster to result from the infusion of poison by the minute sting of an insect, and which afterwards spreads over the tree by the moving sap. But sufficient evidence has not been furnished to establish this opinion, nor the insect in question detected.

Sufficient evidence appears to have been furnished, however, to prove that a tree, badly diseased, is infected throughout with the poison; as suckers from such a tree will always sooner or later become affected. Buds from diseased trees, placed in healthy stocks, soon exhibit the excrescences. But seedlings or suckers from a healthy tree usually escape, unless in near proximity to unhealthy trees.

The remedy for this disease is certain and efficient, if vigilantly applied. It consists in cutting off and burning all the excrescences as soon after their first appearance as practicable. As the poison spreads, it is desirable to remove the wood of the branches some inches from the apparently affected parts. If the tumors, however, break out on the trunk or main limbs, it may be difficult to do this without cutting away the whole tree. As much of the wood is therefore to be cut out as may exhibit the least indication of disease; and the wound washed with a solution of copperas, as recommended and successfully practiced by Downing, or with strong brine, as found beneficial by Dr. Harris and others. The only instances where the remedy has failed, is where it has been but very partially applied, or where the disease has been suffered to spread for a time unchecked. The only way is to cut and continue cutting, so long as any traces remain. This will be found to check, and by perseverance, to remove the disease. As a general but not universal rule, the yellow plums are not so liable to excrescences as purple varieties, unless surrounded by diseased trees.

The *leaf-blight*, or premature casting of the foliage, proves in some seasons a serious disaster to the plum, as it checks the growth of the shoots, and prevents the ripening of the fruit. Occasionally it has been so severe as to spoil entirely the value of the crop. No satisfactory cause has been assigned for this malady, other than the want of proper food in the soil, and among the successful remedies noticed,

the following, on the authority of F. R. Elliott, of Cleveland. "A small tree of the Imperial Ottoman, six feet high, and an inch and a half in diameter. About this I placed last winter nearly two bushels of leached wood ashes, and this entire season, (1848,) the foliage has kept full and of good color, while trees all around and within twenty feet, have uniformly cast theirs." The use of salt as a manure has to some extent, contributed to a similar result, in some cases quite successfully.

DRYING PRUNES.

An article of considerable commerce is furnished by the French prunes, or dried plums, inported into this country The abundant crops of the plum tree, in some parts of our country, may render it desirable that the best means of drying should be known. By a selection of the richest varieties, there is no doubt that prunes superior to those of foreign preparation might be easily obtained. The following description of an oven purposely built for prunes, and doubtless with some modifications, well adapted to the drying of other fruits, is given in Liegel's Treatise, (German,) as quoted in the Horticulturist. The amount of heat obtained by a small quantity of fuel, commends it to the particular attention of those engaged in drying fruit:

"Prunes, says Liegel, have become an important article of commerce. In order to have them fair and glossy, they must be *suddenly cooled*, when withdrawn from the oven.

"The country people in this part of Germany, prepare their prunes by putting them into their bread ovens. I have put up, for my own use, a very conveniently arranged drying apparatus, which, after the experience of many years, I am induced to recommend; and for the construction of which I give the annexed drawing and explanatory description.

"The vault or exterior of the oven, four and a half feet long, is surrounded by a brick wall one foot thick, so that the whole stove, *a b c d*, (see figs. 247 and 248,) is exactly six feet every way; the front wall, *n*, being only half a foot in thickness. At the top, the vault is arched over with six inches of brick work at the crown of the arch. The flues *i i*, are about fourteen inches square. The hurdles or trays *m m*, for containing the prunes, rest upon shelves fixed

upon two bearers. It would be better if they rested upon *rollers*, so as to admit of their being pushed in, and drawn out, with greater ease. These lines of trays are placed at a distance of six inches from the furnace, so as to keep the fruit from too great a heat; they may be made entirely of wood, but it will be better if the bottoms are of open-work, like sieves. Their weight is such that they may be easily managed by a woman; but in preparing prunes on a large scale, let them be made of greater length and breadth, so as to just come within the strength of a more robust person.

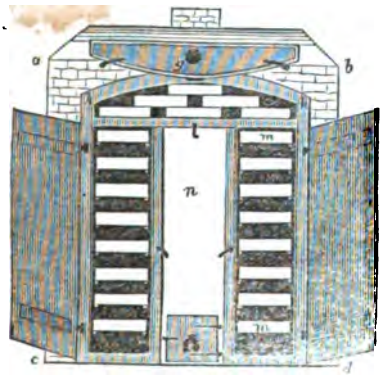


Fig. 247.

"The wooden frame, *h h*, is that on which the two doors are hung. The door, *g*, which covers the arch, (and which is represented in the cut as open and fastened up,) shuts up the front of the upper part of the oven. In the middle of this upper door or flap, is a round vent hole, for the escape of the moist vapor. *k*, is an iron damper or slide, to be placed in the flue at *l l*, in order to regulate the heat.

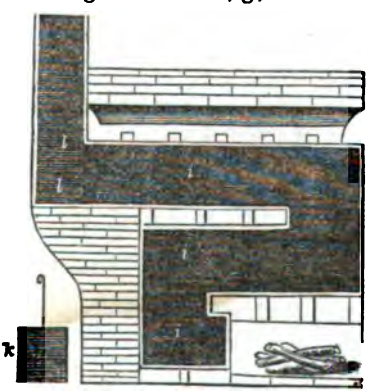


Fig. 248.

"A thousand fully ripe Quetsches, (prune plums) make about ten pounds of dried prunes.

"Plums of different kinds may be dried, either whole, or deprived of their skins and stones. In the latter case, they are styled *prunelles*.

When the White Perdrigons are used for this purpose, they are merely stoned, without skinning; the latter, from the delicacy of their skins, not being deemed necessary.

"For *prunelles*, perfectly ripe and sweet plums are to be taken, and suffered to wilt a little in the open air, in order o facilitate stripping off the peel. A better and more expeditious way is to pour hot water over them, and suffer them to steam a few moments.

"The stone is pressed out at the stem end. In the drying ovens, these prunes must be very carefully and gradually dried. They may also be dried, but not so easily, in the sun."

VARIETIES.

SYNOPSIS OF ARRANGEMENT.

DIVISION I. GREEN, WHITE, OR YELLOW.

CLASS I. FLESH NEARLY FREE FROM THE STONE.

Section I. Fruit large.
Section II. Fruit of medium size.
Section III. Fruit small.

CLASS II. FLESH ADHERING TO THE STONE.

Section I. Fruit large.
Section II. Fruit medium in size.
Section III. Fruit small.

DIVISION II. RED, PURPLE, OR BLUE.

CLASS I. FLESH NEARLY FREE FROM THE STONE.

Section I. Fruit large.
Section II. Fruit medium in size.
Section III. Fruit small.

CLASS II. FLESH ADHERING TO THE STONE.

Section I. Fruit large.
Section II. Fruit medium in size.
Section III. Fruit small.

DIVISION I. GREEN, WHITE, OR YELLOW.

CLASS I. FLESH NEARLY FREE FROM THE STONE.

Section I. Fruit large.

Ghiston's Early. Large, oval, clear yellow, bloom light; flesh yellow, of pleasant flavor. Resembles, considerably, the Yellow Egg plum, but the flesh is free from the stone. Rather early, or a fortnight before the first of autumn.

IMPERIAL GAGE. (*Syn.* Flushing Gage, Prince's Imperial Gage, White Gage, *of Boston.*) Fruit rather large, oval, suture distinct; stalk three-fourths of an inch long, slightly hairy, evenly sunk; surface green, slightly tinged yellow, with marbled green stripes; bloom copious, white; flesh greenish, juicy, melting, rich, sometimes adhering, but usually nearly free from the oval, pointed stone. Ripens first of autumn. Very productive. Shoots long, upright, vigorous, slightly downy; leaves with a slight shade of blue. Often insipid on heavy soils. A single tree, near Boston, yielded fifty dollars of fruit in one year.

JEFFERSON. Large, oval, base slightly narrowed, suture slight; greenish yellow, becoming golden yellow, often faintly reddened to the sun, bloom thin, white stalk an inch long, sunk little or none; flesh rich yellow, moderately fine-grained, in well ripened specimens orange very juicy, nearly free from the long, pointed stone; flavor rich, luscious, excellent. As large as the Washington, and though inferior to the Green Gage and some others in flavor, it is one of the most valuable of all plums. Ripens end of summer. Origin, Albany. Shoots smooth, growth closely resembles Coe's Golden drop.

LAWRENCE'S FAVORITE. (*Syn.* Lawrence Gage.) Large, roundish, slightly oblong-oval, obtuse; surface dull yellowish-green, clouded darker; bloom light, blueish-green; base, when ripe, with a brownish-red net-work and dots; stalk half an inch long, small, cavity narrow; flesh, greenish, melting, juicy, rich, excellent; next to the Green Gage in quality. Shoots short, rather upright,

Fig. 249—*Imperial Ottoman.* Fig. 250—*Washington.* Fig. 251—*Jefferson.* Fig. 252—*Lawrence's Favorite.*

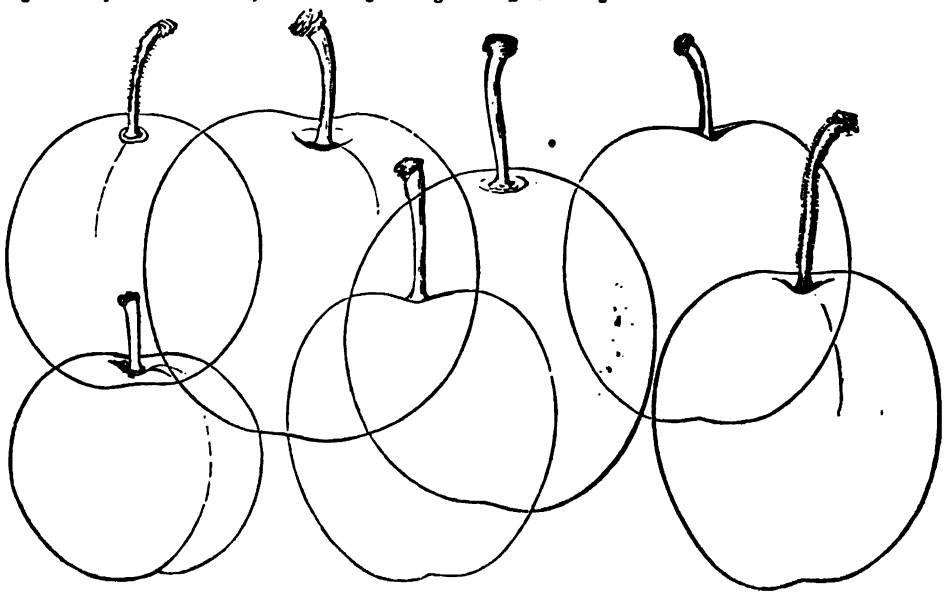


Fig. 253—*Green Gage.* Fig. 254—*Imperial Gage.* Fig. 255—*Bleecker's Gage.*

downy; leaves small, dark green. Rather early or a fortnight before the first of autumn. Origin, Hudson, New-York.

WASHINGTON. (*Syn.* Bolmar, Bolmar's Washington.) Large, often very large, roundish-oval, suture obscure, distinct at base; surface yellowish-green faintly marbled, often with a pale red blush; stalk one-half to three-fourths of an inch long, slightly downy; cavity wide, shallow, flesh rather firm, sweet, mild, moderately rich, free from the pointed stone. Rather early, or the last fortnight of summer. Shoots downy, very vigorous, leaves very large. Origin, New-York city. This variety, although not high in flavor, is a general favorite for its free growth, great productiveness, beauty, fine texture, and adaptedness to all soils.

Section II. Fruit medium in size.

Albany Beauty. (*Syn.* Denniston's Albany Beauty.) Size medium or rather small, roundish oval, with a slight neck at base, suture obscure; surface pale whitish green, purple dots numerous, bloom thin; stalk an inch or more long, slender, scarcely sunk; flesh yellow, moderately juicy, rich, sweet, free from the small, pointed stone Ripens the last week in summer. Shoots slightly downy Origin, Albany, N. Y. New.

Apricot. (*Syn.* French Apricot.) Size medium or rather large; roundish, suture deep; stalk scarcely half an inch long; surface yellow, dotted and tinged with red in the sun; bloom white; flesh yellow, rather firm, slightly bitter, becoming, when ripe, melting, juicy, and pleasant. Rather early. Shoots quite downy.

The English Apricot plum is a third-rate, clingstone, oval fruit, with smooth shoots.

Autumn Gage. (*Syn.* Roe's Autumn Gage.) Size medium, ovate, slightly conical; stalk three-fourths of an inch long, not sunk; surface pale yellow, bloom thin, whitish; flesh greenish-yellow, juicy, sweet, delicate, pleasant, free from the long, pointed, compressed stone. Leaves pointed, shoots smooth, spreading. Ripens rather late. Growth very slow. Very productive. Origin, Newburgh, N. Y

Bleecker's Gage. Size medium; roundish-oval, regular, suture obscure; stalk an inch long, rather stout, downy, slightly sunk; skin yellow, with sunken white specks; bloom thin, white; flesh yellow, rich, sweet, luscious, partly free from the pointed stone. Ripens at the end of summer. Shoots downy. Distinguished from Prince's Yellow Gage by its larger stalk and later maturity. Origin, Albany, N. Y.

Denniston's Superb. Size medium; round, obscurely oval, slightly flattened, suture distinct; surface pale yellowish-green, slightly dotted and clouded with purple, bloom thin, stalk rough, three-fourths of an inch long, moderately sunk; flesh thick, (stone small,) not juicy, rich, vinous, free from the thick, roundish stone. Ripens rather early, or last fortnight of summer. Resembles Green Gage, rather larger, earlier, and not so good. Shoots downy. Very productive. Origin, Albany, N. Y. One of the handsomest of plums.

Hudson Gage. Size medium; oval, suture obscure, one side slightly larger; surface yellow, clouded or streaked faint green, bloom thin, white; stalk about two-thirds of an inch long, moderately sunk; flesh greenish, juicy, melting, rich, sprightly, excellent, nearly free from the small stone. Ripens two weeks earlier than Washington, and three weeks before Imperial Gage, which it partly resembles. Origin, Hudson, N. Y.

Reine Claude de Bavay. Round-oval, greenish-yellow, spotted with red, with small, violet-colored longitudinal veins; flesh rather firm, juicy, sugary, rich, of fine quality, adhering slightly to the stone. Shoots smooth, leaves roundish, shining,—the growth resembling Washinton, but leaves smaller and shoots slenderer. Very productive. Origin, Malines, in Belgium. New.

Coe's Golden Drop has been disseminated to some extent for this variety.

St. Martin's Quetsche. Size medium; ovate, broadest at base; surface pale yellow; often spotted with brown; bloom white; flesh yellowish, very juicy, rich, excellent, Ripens at mid-autumn, and keeps long. Shoots smooth.

A profuse bearer. One of the best late plums. Profitable. German. New.

White Imperatrice. (*Syn.* White Empress, Imperatrice Blanche.) Size medium, obovate, slightly flattened at ends, suture rather obscure; surface bright yellow, with red dots to the sun, bloom very thin; stalk half to three-fourths of an inch long, cavity narrow; flesh crisp, juicy, translucent, free from the small oblong stone. Season medium, or early in autumn. Resembles St. Catherine, but differs in being a freestone, and inferior in quality. Shoots smooth. But little known in this country.

Yellow Gage, Prince's. (*Syn.* American Yellow Gage.) Size medium; oval, slightly broadest at base; suture a mere line; surface golden yellow, slightly clouded; bloom white, copious; stalk an inch long, cavity small, round; flesh deep yellow, rich, sugary, melting, sometimes rather dry. Ripens early in 8 mo., (Aug.) shoots smooth, short-jointed, leaves glossy, tree becoming spreading. Origin, Flushing, L. I.

This is wholly distinct from the English Yellow Gage of the next section.

Section III. Fruit Small.

Drap d'Or. (*Syn.* Yellow Perdrigon, Mirabelle Grosse.) Rather small, round, suture indistinct, apex dimpled; stalk half an inch long, slender; surface golden yellow, sometimes a few crimson dots to the sun; flesh yellow, sweet, rich, often half dry, partly adhering to the stone; ripens a week before the Green Gage. Shoots slightly downy, growth slow. Not so good as Morocco, but bears better.

GREEN GAGE. (*Syn.* Reine Claude, Bruyn Gage.) Rather small; round; suture faint; surface green, becoming yellowish green, usually with reddish brown dots and network at base; stalk half to three-fourths of an inch long, scarcely sunk; flesh pale green; melting, juicy, exceedingly sweet and rich, and unequalled in flavor. Ripens about the middle of 8mo., (Aug.) shoots smooth,

buds with large shoulders, growth slow, and young trees difficult to raise in most localities. French. Old.

There are many seedlings, inferior to the original, and many worthless green plums called by this name. F. R. Elliott, one of the best informed pomologists of Ohio, says that he knows of but one or two genuine bearing trees in that State.

The Schuyler Gage, of Albany, is a sub-variety, closely resembling the Green Gage.

IMPERIAL OTTOMAN. Nearly medium in size, oval, suture on one side half way from base to apex; somewhat pellucid; surface pale greenish-yellow, marbled; stalk three-fourths of an inch long, downy, slender, curved, scarcely sunk; surface dull yellow, clouded darker, bloom thin; flesh very juicy, sweet, excellent, scarcely adhering to the pointed stone. Quite early, or two or three weeks after midsummer. Great bearer. Nearly or quite as early as Drap d'Or, and much better. Shoots slightly downy; tree hardy, succeeds well as far north as Maine.

Mirabelle. Very small, obovate, suture distinct; stalk half an inch long, slightly sunk; surface a fine yellow, slightly spotted with red, bloom white; flesh orange, sprightly, becoming dry. Ripens with the Green Gage. Shoots downy, tree small. A small, beautiful, second-rate plum, very productive, and valued for preserving. Its seedlings are used as stocks for dwarf plums.

Primordian. (*Syn.* Jaune Hâtive, or Early Yellow, White Primordian.) Small, obovate, necked; suture small; stalk slender, downy, half an inch long; pale clear yellow, bloom thin; flesh yellowish, moderately juicy, with a rather sweet mild good flavor; very free from the stone. The earliest plum, ripening before midsummer. Shoots quite slender, very downy, growth slow, and young trees difficult to raise.

Yellow Gage, English. (*Syn.* Little Queen Claude.) Small, round, suture on one side distinct; surface pale yellowish green, becoming yellow, with a few reddish dots, bloom dense; stalk half an inch long, slender, slightly sunk; flesh very sweet, pleasant, quite free from the

stone. Ripens nearly with the Green Gage. Shoots long, smooth. Of French origin.

Class II. Flesh adhering to the Stone.

Section I. Fruit large.

Buel's Favorite. Rather large, ovate, broadest at base suture distinct half round; stalk two thirds of an inch

Fig. 256—*Primordian.* Fig. 257—*White Damson.*

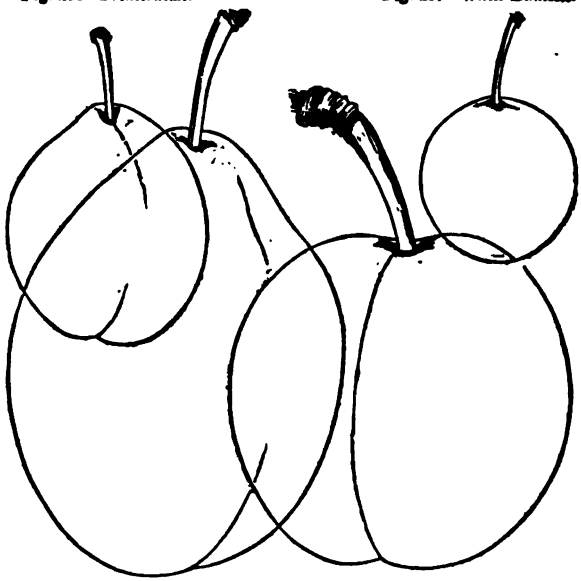


Fig. 258—*Coe's Golden Drop.* Fig. 259—*Huling's Superb.*

long, rather stout, little sunk; surface pale green, thickly sprinkled with lighter dots, base with reddish specks; flesh greenish-yellow, rather firm, juicy, rich, high flavored, adhering to the long pointed stone. Ripens at the close of summer. Shoots, smooth, reddish. Origin, Albany, N. Y. New.

Bingham. Large, (an inch and three-fourths long,) oval, rather widest at base; surface deep yellow, with rich red

spots to the sun; stalk slightly sunk; flesh yellow, juicy rich, delicious. Season of ripening medium, or end of summer and first of autumn. Shoots downy. Handsome, productive, and valuable. Origin, Pennsylvania.

COE'S GOLDEN DROP. Very large, (often more than two inches long,) oval, suture distinct, one side more enlarged, necked; light yellow, often dotted red to the sun; stalk three fourths of an inch long, rather stiff; flesh yellowish, rather firm, rich, sweet, not fine grained, closely adhering to the pointed stone. Quite late, does not always ripen at the north—requires a long season. An excellent late sort, of English origin. Shoots smooth, rather glossy.

HULING'S SUPERB. Large, often quite large, round ovate, suture shallow, indistinct; stalk one inch long, stout, slightly sunk; skin dull greenish-yellow; bloom pale, thin; flesh rather firm; flavor rich, brisk, excellent. Ripens latter part of summer. Shoots thick, vigorous, downy, leaves very large. A moderate bearer. Origin, Pa.

Large Green Drying. (*Syn.* Knight's Large Drying.) Large, round, greenish-yellow, flesh yellowish, moderately juicy, rich. Rather late. English.

McLaughlin. Rather large, roundish, oblate, much flattened at ends, suture obscure; stalk three-fourths of an inch long, scarcely sunk; skin thin, tender, russet-yellow, sprinkled with thin red, purplish at base; flesh rather firm, juicy, sweet, luscious. Ripens at the end of summer. Growth vigorous, leaves large, glossy, shoots smooth. Origin, Bangor, Maine, where it succeeds well as is very fine. New.

Mulberry. Large, oval, tapering with a neck to the base, suture slight; pale dull yellow, with a few crimson dots; bloom thin; stalk an inch long, slender, scarcely sunk on the obtuse point of the neck; flesh greenish yellow, rather coarse, melting, rich, adhering to the large, oblong, pointed stone. Ripens the first of autumn. Shoots stout. Origin, Albany, N. Y. New.

White Egg. (*Syn.* White Magnum Bonum, White Imperial.) Very large, oval, narrow at ends, necked at base, suture distinct; stalk an inch long, not sunk, surrounded by a fleshy ring at insertion; skin light yellow, bloom thin, white; flesh firm, coarse, acid, becoming sweeter by ripening, adhering closely to the long, pointed stone. Ripens about the end of summer.

The Yellow Egg is very similar in character, but the flesh partly separates from the stone when fully ripe. There appear to be several sub-varieties.

T. Rivers, of Sawbridgeworth, England, says the Yellow Magnum Bonum is an American plum of extreme hardiness—good, but not first rate—flesh clings—and bears more freely than "our old White Magnum Bonum."

Section II. Fruit medium in size.

Dana's Yellow Gage. Size medium, oval, pale yellow, marbled with darker green, bloom very thin: flesh juicy, lively. Season medium. Very productive. Hardy. Mass.

Downton Imperatrice. Size medium, oval, base tapered or with a neck; skin thin, pale yellow; flesh yellow, melting, acid, becoming rather sweet; ripens late, or two weeks before mid-autumn. Shoots smooth, long, strong, upright. For preserving. A cross of the White Egg and Blue Imperatrice.

Emerald Drop. Size medium, long oval, suture deep, one side larger; skin pale yellowish-green, dull green in the shade; stalk three-fourths of an inch long, scarcely sunk; flesh juicy, rather rich, of second-rate quality, adhering to the long pointed stone.

Lucombe's Nonsuch. Medium or rather large, roundish; skin yellowish-green with yellowish-orange, bloom whitish; suture broad; stalk three-fourths of an inch long, cavity wide; flesh rather firm, rich, sweet with acid. Resembles the Green Gage, but larger, more marked with yellow, and much inferior in flavor. English.

St Catherine. Size medium, obovate, suture very distinct, passing half round; skin pale yellow, sometimes slightly

reddish to the sun, bloom thin, white; stalk three-fourths of an inch long, very slender, slightly sunk; flesh juicy, rather firm, rich, fine, often nearly or quite first-rate in flavor. Ripens rather late. Shoots smooth, rather slender.

White Perdrigon. Size medium, oval, narrow at base; skin pale greenish-yellow, with white dots, and red dots to the sun; bloom thin; stalk three-fourths of an inch long, slender; flesh very sweet, slightly perfumed, of fine flavor. Ripens about the end of summer.

Section III. Fruit small.

Byfield. Small, round, suture a mere line; stalk half an inch long, cavity even; skin light yellow, with red spots at base; flesh yellow, adhering to the thick stone. Rather early. Shoots smooth.

White or Yellow Damson. (*Syn.* Late Yellow Damson.) Small, (one inch long,) oval, pale yellow, dotted with reddish-brown; stalk half an inch long, downy, not sunk; flesh rich, sub-acid, agreeable; ripens very late, hanging long on the tree. Shoots smooth, growth free; tree very productive.

DIVISION II. RED, PURPLE, OR BLUE.

Class I. Flesh nearly free from the stone.

Section I. Fruit large.

Columbia. (*Syn.* Columbian Gage.) Very large, nearly globular, one side slightly larger; skin brownish purple, reddish-brown where much shaded, with many fawn-colored dots; bloom blue, copious; stalk one inch long, rather stout; cavity small; flesh orange, moderately juicy, rich, rather coarse, free from the small, compressed stone, or adhering at the edge; flavor good, dot first-rate. Fruit liable to rot. Season medium, or end of summer. Shoots downy, stout, blunt, spreading, leaves nearly round. Popu-

lar from its large size, handsome appearance, and great productiveness. Origin, Hudson, N. Y.

Diamond. Very large, oval, black; bloom blue; stalk three-fourths of an inch long, cavity narrow; flesh coarse, slightly dry, somewhat acid, free from the long pointed stone; flavor poor. Shoots long, downy. Prolific, but coarse, and only fit for cooking.

German Prune or Quetsche. Large, long-oval, curved or swollen on one side, with a long tapering neck at base; suture distinct; skin purple, with a thick blue bloom; stalk three-fourths of an inch long, slender, slightly sunk; flesh green, firm, sweet, pleasant, free from the very long, flat, slightly curved or lunate stone; flavor second-rate—valuable for drying and preserving. Rather late. Shoots smooth. There are several sub-varieties.

Manning's Long Blue. (*Syn.* Large Long Blue, Manning's Long Blue Prune.) Large, long-oval, slightly one-sided, suture obscure; stalk very long, slender, scarcely sunk; skin dark purple, bloom thick, blue; flesh firm, rather juicy, nearly free from the long, pointed stone. Rather late, ripens gradually. Shoots smooth. Tree very productive.

Peach Plum. (*Syn.* Prune Pêche.) Very large, roundish-oblate, regular, flattened at ends, suture distinct, shallow; color varying from salmon to light-brownish red; stalk very short, cavity narrow, shallow; flesh rather coarse, juicy, sprightly, free from the nearly round, very flat, much furrowed stone. Shoots smooth. Quality not very high, but esteemed for its large size, handsome appearance, and early ripening. Matures about ten days before the Washington. Shoots smooth, vigorous.

Red Diaper. (*Syn.* Diaprée Rouge, Mimms, Imperial Diadem.) Large, obovate, somewhat necked; skin reddish-purple, with a few yellowish specks, bloom light blue; stalk three fourths of an inch long, slender, slightly hairy, little sunk; flesh pale green, juicy, melting, rich, of fine, but hardly of the highest flavor; free from the quite

small stone. Season medium or end of summer. Shoots nearly smooth; growth slow.

Red Magnum Bonum. (*Syn.* Purple Egg, Red Imperial, Purple Magnum Bonum, Imperial Violet, Red Egg.) Large, oval, tapering to the stalk, suture strong, one side swollen; surface deep red in the sun; bloom thin; stalk

Fig. 260—*Cox's Late Red*

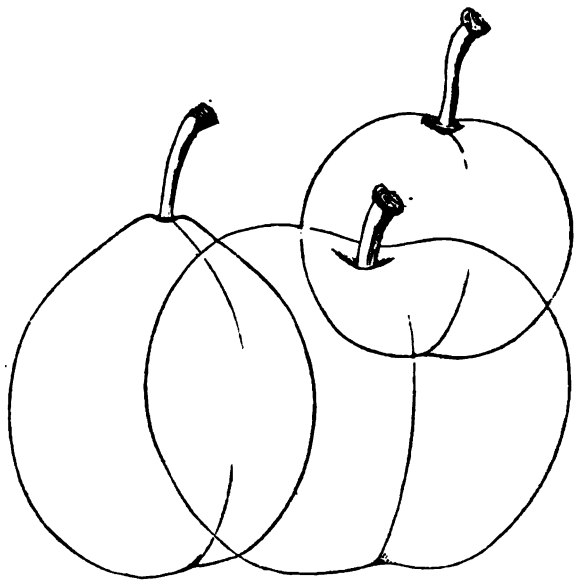


Fig. 261—*Red Diaper.* Fig. 262—*Peach Plum.*

an inch long, slender, cavity narrow; flesh greenish, coarse, firm, sub-acid; valuable only for cooking. Season medium. Shoots smooth. Some sub-varieties are clingstones.

Sharp's Emperor. Quite large, roundish-oval; skin a bright red, paler in the shade, bloom delicate; flesh deep yellow, pleasant, moderately rich. Very productive. Shoots strong, downy, leaves large. English. New.

Thomas. Large, round-oval, slightly irregular, somewhat compressed on the suture; skin salmon color, with a soft red cheek, and numerous dots; stalk hairy, one-half to three-fourths of an inch long, stout; cavity small, narrow; flesh pale yellow, somewhat coarse, mild, pleasant, free from the very light-colored stone. Shoots slightly downy. Productive. Season, medium. Origin, Boston.

Section II. Fruit medium in size.

Coe's Late Red, or Red St. Martin. (*Syn.* St. Martin, Saint Martin Rouge.) Size medium, roundish, suture distinct on one side, skin light purplish red, bloom thin, blue; stalk three-fourths of an inch long, scarcely sunk; flesh rather firm, crisp, rich, vinous. Very late, productive, shoots, downy. A valuable late plum.

Corse's Nota Bene. Rather large, round, surface pale lilac brown, often dull green in the shade; bloom light blue, copious; stalk half an inch long, cavity round, flesh greenish, rather firm, crisp, rich vinous. Very late, very productive, shoots downy. A valuable late plum.

Cruger's Scarlet. (*Syn.* Cruger's, Cruger's Seedling.) Medium, approaching small, roundish oval, suture obscure; surface lively red or bright lilac, with numerous yellow dots, pale fawn color in the shade, bloom thin, blueish; stalk half an inch long, cavity shallow; flesh deep orange, moderately juicy, mild, agreeable, not rich, good. Season, medium. Shoots downy. Hardy, adapted to light soils, very productive. Origin, New-York.

Denniston's Red. Medium or rather large, roundish oval, narrowed to the stalk; suture passing half round; surface a fine light red, with fawn colored dots; bloom very thin; stalk very long, slender, little sunk; flesh amber-colored, rich, good second rate, free from the small, oval, compressed stone. Season medium, or last of summer. Shoots smooth. Origin, Albany, N. Y., probably from a seed of the Lombard or Bleecker's Scarlet.

Fotheringham. Size medium, obovate, suture distinct; skin purple in the sun, reddish in the shade, bloom pale blue;

stalk an inch long; flesh pale greenish-yellow, juicy sprightly, moderately rich. Rather early. Shoots smooth English. Old.

Holland. (*Syn.* Blue Holland, Holland Prune.) Round, slightly flattened, blue or light reddish-purple, bloom blue; cavity small; flesh juicy, melting, sweet, pleasant Season medium or rather late, hangs long. Shoots dow ny.

Horse Plum. (*Syn.* Large Early Damson.) Size medium, oval, suture deep on one side; skin purple, bloom blue; flesh greenish-yellow, rather dry, acid, flavor poor. Season medium. Shoots downy. Common.

Isabella. Medium in size or large, oval, slightly narrowed to the base; skin dark dull red, dotted darker; stalk three-fourths of an inch long, a little hairy, cavity moderate; flesh yellow, rich, juicy, and slightly adhering to the pointed stone. Shoots quite downy. Season medium. English.

Italian Damask. Size medium, nearly round, slightly flattened at base; suture distinct, passing from base to apex; surface violet, becoming brown; stalk half an inch long, slender, cavity small, round; flesh yellowish-green, firm, sweet, high-flavored, very free from the oval, rather thick stone. Season medium. Shoots smooth.

Kirke's. Size medium, round, suture small; skin dark purple, bloom thin, blue; stalk three-fourths of an inch long, cavity slight, flesh greenish-yellow, firm, rich, free from the flat, broad stone. Season medium. Shoots smooth. Resembles the Purple Gage externally. Often spurious. English.

Morocco. (*Syn.* Italian Damask, *erroneously*, Early Morocco, Black Morocco, Early Damask, Black Damask.) Size medium, roundish, slightly flattened at ends; suture on one side only, shallow, skin dark purple, bloom pale, thin; stalk half an inch long, rather stout; flesh greenish-yellow, adhering slightly to the stone, rich, rather acid, becoming sweet. Not first-rate, but valuable for its earliness, ripening ten days before the Washington. Shoots downy. A moderate bearer.

Orleans. (*Syn.* Old Orleans, Red Damask, Monsieur.) Size medium, round, suture distinct, slightly larger on one side; skin dark red, purple in the sun; stalk one-half to three-fourths of an inch long, cavity wide; flesh yellowish, sweet mixed with acid, of second quality in richness, pleasant and good; a fine culinary variety. Rather early. Shoots downy. There are two or three sub-varieties.

Orleans, Early. (*Syn.* New Orleans, Hampton Court, Monsieur Hâtif.) Size medium, round oval, suture shallow, stalk half an inch long, stout or longer and slender; cavity moderate; skin reddish purple, slightly marbled; flesh yellowish-green, rather rich. Quite early, or ten days before the preceding.

Wilmot's Orleans scarcely differs from the Early Orleans.

Pond's Seedling. Medium in size, roundish, purple, stalk short, flesh yellowish, rather dry, sweet with acid, flavor moderate, second or third rate. Early. Shoots downy, Origin, Boston.

Prince of Wales, Chapman's. Oval, bright purplish pink, with a dense bloom; flesh pale amber, free from the stone; shoots vigorous, smooth, leaves broad, roundish Productive. English. New.

Prune d'Agen or *Agen Date.* Size medium, obovate, flattened one side; skin purple, bloom blue; stalk short, flesh greenish-yellow, sweet. Very late, profusely productive. Shoots smooth, leaves narrow. French. Culinary.

Purple Favorite. Size medium, or rather large, round obovate; suture obsolete; skin brownish purple; bloom thin, light blue; stalk three-fourths of an inch long scarcely sunk; flesh pale greenish, juicy, tender, melting, rich, sweet, excellent, free from the very small, roundish stone. Season about medium, or last week of summer Shoots nearly smooth, short-jointed, growth slow, much resembling that of the Red Diaper. Origin, Newburgh, N. Y.

PURPLE GAGE. (*Syn.* Reine Claude Violette. Violet Queen Claude.) Size medium, roundish, slightly flat-

tened at ends, suture distinct, shallow; surface violet, bloom light blue; stalk an inch long, cavity narrow; flesh rather firm, greenish yellow, rich, sugary, of very high and excellent flavor, free from the oval, compressed

Fig. 260—*Early Royal.* Fig. 260—*Red Gage.*

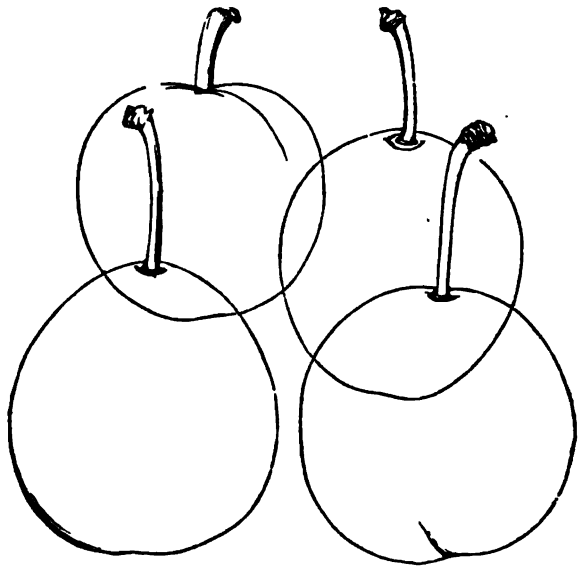


Fig. 262—*Purple Favorite.* Fig. 263—*Royal.*

stone. Ripens rather late, hanging long, and slightly shrivelling on the tree. Shoots smooth, resembling those of the Green Gage. A spurious sort is often disseminated.

Red Apricot. (*Syn.* Abricotée Rouge.) Size medium, oval, flattened at ends; stalk nearly an inch long, cavity slight; skin clear red in the shade, violet in the sun; bloom blue, copious; flesh orange, sweetish, rather dry and insipid. Season medium. Shoots smooth. French.

Red Gage. Medium or rather small, round-ovate, brownish-red, stalk rather slender, cavity narrow; flesh green-

ish-amber, juicy, melting, rich, mild sweet, free from the small stone; flavor unusually pleasant and refreshing Rather early. Shoots dark reddish, smooth; leaves o young trees deep green, crimpled. Origin, Flushing Long Island,

Red Perdrigon. Medium in size, roundish, slightly oval skin deep red; bloom thick, lilac; stalk an inch long cavity small, round; flesh bright yellow, slightly crisp juicy, sweet. Season medium or rather late. Shoots downy.

Royale. (*Syn.* Royal, La Royale.) Size medium, some times rather large, round, slightly narrower towards the base, or approaching obovate; suture distinct on one side at apex; skin reddish-purple, bloom very thick; stalk three-fourths of an inch long, cavity narrow; flesh dull yellow, rather firm, melting, juicy, rich, of excellent flavor. Ripens first of autumn. Shoots very downy, growth slow, tree spreading, moderately productive. French.

Royale Hative, or "Early Royal." (*Syn.* Mirian.) Size medium, roundish, slightly wider at base; skin light purple, stalk half an inch long, stout, scarcely sunk; flesh amber yellow, with a rich, high flavor, nearly free from the small, flattened, ovate stone. Very early. Resembles Purple Gage, but a month earlier. Shoots very downy French. New. Rare.

De Montfort, according to Rivers, is much like Royale Hative, but larger, and later.

Section III. Fruit small.

Blue Gage. (*Syn.* Azure Hâtive, Black Perdrigon.) Small, round, dark blue, bloom light blue; stalk three-fourths of an inch long; flesh greenish, juicy, sub-acid, pleasant; rather early, shoots slender, downy; tree very productive. Different varieties appear to be described by Prince, Coxe, and Downing, under this name, none of which are highly commended.

Cheston. (*Syn.* Violet Diaper.) Rather small, oval, dark purple; bloom blue; stalk quite short, not sunk; flesh firm, sweetish, pleasant; early; shoots downy.

Damson. (*Syn.* Common Damson, Early Damson, Purple Damson, Blue Damson.) Small, oval, (an inch long,) purple, bloom thick, blue; melting, juicy, sub-acid, partly free from stone. Early autumn. Profusely productive. The Sweet Damson is less acid. The Winter Damson is small, round, purple, bloom copious, with an acid, slightly astringent flavor; it bears enormous crops, which hang uninjured till late in autumn. The Damson makes good preserves. There are several sub-varieties.

Elfrey. Rather small, oval, blue; flesh greenish, very sweet, dry, firm, very free from the stone; shoots smooth, leaves glossy. Very productive. Not so good as Orleans.

Howell's Early. Rather small, oval, slightly angular, suture obsolete; skin light brown, often greenish-yellow in the shade; bloom thin, blue; stalk three-fourths of an inch long, slender, not sunk; flesh amber-colored, juicy, sweet, perfumed, free from the small, oval stone. Quite early, ripening a little before the Morocco and Early Orleans. Shoots slender, grey, downy; tree very productive. Newburgh, N. Y.

Judson. Rather small, roundish, slightly oval, base a little flattened, suture indistinct; surface a handsome damask or pink, slightly mottled; stalk one inch long, slender, cavity small, rather deep; flesh juicy, rich, vinous, high-flavored, free from the rather large stone. Ripens a few days before the Green Gage. Origin, Lansingburgh, N. Y. New.

Queen Mother. Small, round, an inch in diameter, dark purplish red; stalk half an inch long; flesh yellowish, sweet, rich, free from the quite small stone. Rather late Shoots smooth, growth, rather feeble.

Schenectady Catherine. Size small or nearly medium, roundish, slightly narrowed to the apex; suture rather shallow; skin deep purple-violet in the shade, slightly netted on the sunny side; stalk three-fourths of an inch long, slender, cavity deep, narrow; flesh greenish-yellow, melting, sweet, rich, excellent, next to the Green Gage

in quality, and ripening at the same time. Shoots rather slender, smooth. Origin, Schenectady, N. Y. New. This is a quite distinct variety, often reproducing itself from seed, not perceptibly varying from the parent.

Class II. Flesh adhering to the stone.

Section I. Fruit large.

Brevoort's Purple. (*Syn.* New-York Purple.) Large, oval, suture distinct at base; skin reddish, with a violet bloom; stalk three-fourths of an inch long, cavity deep, narrow; flesh soft, juicy, sub-acid, moderately rich, second-rate. Season medium. Shoots long, smooth; tree productive. Origin, New-York.

Duane's Purple. Very large, oblong-oval, longer on one side; slightly narrowed towards the base; skin reddish purple, bloom lilac; stalk three-fourths of an inch long, slender, cavity narrow; flesh juicy, moderately sweet, of second-rate flavor, adhering mostly to the stone. Rather early, ripening with the Washington. Shoots very downy, leaves large, downy beneath. Popular from its large size and handsome appearance. Origin, Duanesburgh, N. Y.

Goliath. Large, roundish oblong or oval, enlarged on one side; skin deep red, approaching blue or purple; bloom thin, blue; stalk half or three-fourth's of an inch long, cavity very deep, distinct; flesh yellowish, mostly adhering to the stone, juicy, coarse, sub-acid. Season medium. Shoots grey, very hairy, leaves narrow. Productive.

Gwalsh. Large, obovate, regular, suture obscure; skin rich dark purple, bloom blue; stalk three-fourths of an inch long, slightly sunk; flesh yellow, juicy, sub-acid, second-rate. Rather early. Shoots nearly smooth. New-Jersey.

Smith's Orleans. Large, oval, slightly wider at base, a little irregular, suture deep on one side; skin reddish-purple, becoming very dark, bloom deep blue; stalk small, slender; cavity narrow, deep; flesh deep yellow, slightly

firm, juicy, rich, nearly first-rate. Shoots vigorous, straight, glossy reddish purple; leaves dark green, crimpled. Ripens the last week of summer. Productive in nearly all soils. Long Island.

Hovey considers this identical with Cooper's Plum, of Coxe and others.

Nectarine. Large, regular, roundish; skin purple, bloom blue; stalk half an inch long, stout; flesh dull greenish-yellow, often tinged with red, rather coarse, rich, acid, partly adhering to the stone. Rather early. Shoots nearly smooth, leaves broad. Quite distinct from the Peach Plum of the preceding class.

Royal Tours. (*Syn.* Royale de Tours.) Large, roundish, suture deep, half round, one side swollen; a white depressed point at apex; skin red in the shade, deep violet in the sun, bloom copious, blue; stalk half to three-fourths of an inch long, cavity narrow; flesh greenish-white, rather firm, juicy, rich, high-flavored, adhering closely to the large, oval, flattened stone. Quite early; shoots quite downy. Valuable for its earliness and good quality. The genuine sort is very rare. French.

Section II. Fruit medium in size.

Blue Imperatrice. (*Syn.* Imperatrice.) Size, medium, obovate, narrowed to the base in a somewhat obconic neck; skin deep purple, bloom copious, blue; stalk three-fourths of an inch long, slightly sunk; flesh greenish-yellow, rather firm, not juicy, rich, sugary; ripening very late, and hanging till nearly winter.

The variety known erroneously as the *Semiana* or *Blue Imperatrice* of Boston, and disseminated as such, differs from the true Imperatrice in its shorter and smaller neck, much shorter and not sunk stalk, and more acid flavor. It is very productive, and a good very late culinary sort.

Blue Perdrigon. (*Syn.* Violet Perdrigon.) Medium in size, oval, slightly narrowed at base, skin reddish, becoming purple, with many brown dots; bloom whitish, very copious; stalk three-fourths of an inch long, cavity

small; flesh greenish-yellow, rather firm, rich, sweet, good. Season medium. Shoots downy.

Corse's Admiral. Medium or rather large, oval, slightly obovate, much larger on one side; skin light purple, with yellow specks; bloom pale lilac; stalk three-fourths to an inch long, hairy, slightly sunk; flesh greenish-yellow, juicy, sprightly, second-rate. Rather late. Productive. Shoots quite downy. Origin, Montreal.

Corse's Field Marshal. Medium or rather large, oval, bright purplish red, handsome; stalk rather slender, three-fourths of an inch long, slightly sunk; flesh greenish-yellow, juicy, sub-acid, adhering closely to the long, pointed stone. Season medium. Origin, Montreal.

Domine Dull. (*Syn.* German Prune, of some.) Size medium, long-oval, suture very obscure; skin very dark purple, bloom blue; stalk three-fourths of an inch long, scarcely sunk; flesh juicy, becoming dry, rich, sweet, good. Profusely productive. Rather late. Origin, Kingston, N. Y.

Ickworth Imperatrice. Medium or rather large, obovate, purple, with irregular streaks of fawn color; stalk medium; flesh greenish-yellow, sweet, juicy, rich, mostly adhering to the rather small stone. Very late, keeping into winter, becoming dryer and sweeter. Shoots smooth. English.

Lombard. (*Syn.* Bleecker's Scarlet.) Size medium, sometimes rather large, round-oval, slightly flattened at ends, suture obscure; skin violet red; stalk very slender, half to three-fourths of an inch long, cavity broad; flesh deep yellow, pleasant, not rich, but of fine quality. Rather early or medium in season, ripening a week or two before the end of summer. Hardy, very prolific, well

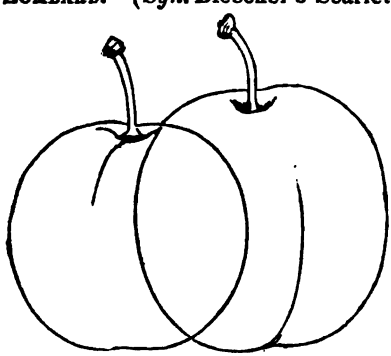


Fig. 284—*Frost Gage*

Fig. 285—*Lombard or Bleecker's Scarlet.*

adapted to light soils,—valuable. Shoots thrifty, quite smooth or glossy, bright purple; leaves much crumpled. Origin, Albany, N. Y.

This is a strongly fixed variety, and has in many instances produced seedlings very closely resembling itself.

Long Scarlet. (*Syn.* Scarlet Gage, Red Gage erroneously.) Size medium, oblong-obovate, elongated, one side swollen, base narrow; skin bright red, bloom fine lilac; stalk three-fourths of an inch long, cavity narrow; flesh deep yellow, acid, becoming rather rich and sweet, of second-rate flavor, but makes beautiful bright red jelly. Season medium. Shoots downy. Orange co., N. Y.

Peoly's Early Blue. Size medium, oblong, suture very obscure; skin dark blue, bloom light blue; stalk short; flesh yellow, pleasant, second-rate, adhering partially to the bluntly terminated stone. Early. Shoots very downy. Mass.

Suisse. (*Syn.* Prune Suisse, Swiss Plum, Simiana, Monsieur Tardif.) Medium or rather large, round, suture broad, shallow; a sunk point at apex; skin lively violet red, thickly dotted, and slightly marbled; bloom blue, copious; stalk three-fourths to an inch long, cavity wide, flesh crackling and melting, flavor brisk, rich, slightly sharp, adhering to the thick, rough-edged stone. Quite late. Shoots smooth. Distinct from the "Semiana," of Boston.

Section III. Fruit small.

American Wheat. Quite small, globular, pale blue, bloom white, stalk slender, half an inch long, flesh greenish, melting, juicy, sweet, second-rate, dropping when ripe. Season, medium. Very productive. Shoots slender, smooth, leaves small, light colored. Mass.

Cherry. (*Syn.* Early Scarlet, Myrobolan.) Small, (one inch diameter,) round, remotely heart-shaped, bright red, bloom faint; stalk short and slender; cavity narrow; flesh juicy, slightly fibrous, soft, melting, sub-acid, not rich, second-rate, adhering to the oval, pointed stone.

Ripens very early or about midsummer, its only value. This is a distinct species, (*Prunus cerasifera,*) and is distinguished by its smooth, slender shoots, small bushy head, and narrow leaves. There are several varieties.

The *Golden Cherry Plum*, (Market Plum, of Hoffy,) is heart-shaped, yellow, speckled with scarlet in the sun, productive, and slightly earlier than the common cherry plum.

Early Tours. (*Syn.* Précoce de Tours, Early Violet.) Medium or small, deep purple, bloom copious, blue; stalk half an inch long, cavity narrow; flesh dull yellow, slightly fibrous, rather sweet, melting, good. Quite early. Shoots downy.

Frost Gage. Rather small, round-oval, suture distinct on one side; skin deep purple, bloom thin; stalk half to three-fourths of an inch long, scarcely sunk; flesh juicy, sub-acid, becoming sweet, melting, of fine but not of the highest flavor; very valuable from its hardiness, late maturity, and great productiveness. Shoots smooth, rather slender; tree tall, upright. Eighteen hundred dollars, says Downing, were received by a single farmer near Newburgh, for one year's crop of this plum.

ADDITIONAL VARIETIES.

Muscle. Fruit oblong, dark red, stone large, flesh thin, of poor flavor. This plum is used only for stocks.

Sloe, (*Prunus spinosa.*) Fruit small, nearly globular, dark violet, bloom thick, flesh very acid and powerfully astringent. A large shrub, ten or twelve feet high, thorny; flowers abundant, ornamental. The double flowering is rather smaller, and more beautiful. Some writers, with too much poetical freedom, speak of the common plum, (*Prunus domestica,*) as an ameliorated sort from the "austere sloe," which being a distinct species, such a change is impossible.

Red Chicasaw. (*Prunus Chicasa.*) Small, roundish, light red, flesh melting, soft, pleasant. Ripens soon after mid-

summer. Another variety produces yellow fruit. Tree low, spreading, bushy, thorny; leaves narrow-lanceolate, somewhat in shape like those of a peach. A native of the Western States.

Wild Red or Yellow Plum. (*Prunus americana.*) There are many wild varieties of this species, the fruit varying from roundish to oval, and presenting various shades of color, mostly light red. Some have a pleasant, rich, sweet, or sub-acid pulp. Tree 10 to 15 feet high, leaves ovate, coarsely serrate, branches somewhat thorny. Ripens latter part of summer. The quality of the fruit is improved by cultivation. It is sometimes used as stocks for the plum and apricot.

The Beach Plum. (*Prunus maritima.*) Fruit nearly medium in size, varying from reddish to dark purple, pleasant, astringent. A shrub with stout straggling branches; leaves oblong-ovate. A native of the sea-coast of the northern and middle states.

CHAPTER VII.

THE CHERRY.

PROPAGATION. The cultivated varieties of the cherry consist of two distinct classes of sorts; the first comprising the Mazzards, Hearts, and Bigarreaus, is characterized usually by the tall upright growth and pyramidal form of the tree, by the large, vigorous, and straight young branches, and by a sweet or bitter, but not a sour taste. The second class, or round-fruited, including the Dukes, Morellos, and the common pie cherry, has small, irregular, and thickly growing branches, and a decidedly acid fruit. Observation will soon enable any one to distinguish these two classes, even where the trees are not more than a foot in height. It is the former only that are valuable as stocks for grafting and budding, on account of their straight and rapid growth.*

The stones, as soon as they are taken from the fruit, should be dried only enough to prevent mouldiness, and then mixed with an equal quantity of clean moist sand. This will preserve a proper degree of moisture, and allow the easy separation of the stones in planting. The best way to keep them till spring, is to bury them in shallow pits on a dry spot of ground, covering them with flat stones and a few inches of earth.

The seed may be planted in autumn or spring. If in autumn, the ground should be dry, and entirely free from all danger of becoming flooded or water-soaked. Unless the soil

* Attempts are not unfrequently made to propagate the common cherry on the wild Black Cherry, (*Cerasus virginiana*,) or on the Choke Cherry, (*C. serotina*.) Such attempts prove to be failures, the sorts being too dissimilar in their natures to favor union. These two species, it will be observed, have racemose inflorescence, while in the cultivated cherry the flowers are simply in fascicles or umbels. Some of the wild species, (as the Sand Cherry, *C. pubescens*,) having the latter kind of inflorescence, have been successfully used as stocks, and their adoption might possibly prove useful at the south and west, where the Heart cherries fail.

is quite light, the seeds should be covered with black mould to prevent the formation of a hard crust upon the surface which would prevent the young plants from breaking through. But, usually, spring is the best season, if the planting is done the moment the frost is out of the ground; for the seeds sprout and grow on the first approach of warm weather. The distance should be the same as for the peach and apple; and nearly the same directions are applicable to their management in the nursery rows.

Good seedlings, averaging a foot and a half high, may be transplanted from the seed beds when a year old, and if well cultivated in good soil, may be budded the same season. Where the buds fail, the trees may be grafted the following spring.

Budding can only succeed with thrifty, freely growing stocks, and with well matured buds. About the time, or a little after the most vigorous stage of growth, or just as the terminal buds on the shoots *commence* forming, is the most successful period. If earlier, the buds will usually be too soft; if later, the bark will not peel freely, nor the buds adhere well. This period usually commences about mid-summer, and continues, under the various influences of season and soil, for two or three weeks, and sometimes more than a month. Success will be found to depend also upon cutting out with the bud, a larger portion of the wood than common with other budding, or equal to at least one-third the diameter of the shoot. This will be found particularly useful where the buds are slightly immature, retaining in them a larger portion of moisture, and preventing their curling off from the stock.

Great difficulty is often experienced in successfully grafting the cherry. It succeeds well, if performed very early in the spring, before the slightest swelling of the buds, and before the frost has disappeared from the ground. After this period it is greatly liable to failure.

In propagating the slower-growing, round-fruited varieties, good trees are often soonest obtained by grafting or budding them at standard height into large straight stocks. If grafted, they soon form a handsome head; if budded,

care must be taken by judicious pruning to prevent the young shoots from growing all on one side.

Pruning the cherry except to form the head, is rarely needed. When necessary, midsummer is found to be the most favorable season, and least attended with the exudation of gum.

SOIL.

In the northern states, the cherry being a very hardy tree, will thrive in nearly all good soils. But a *dryer* soil than for most other species is found preferable; a sandy or gravelly loam is best. In wet places, or on water-soaked sub-soils, it does not flourish, and soon perishes.

DWARF CHERRIES.

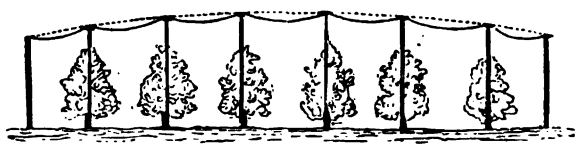
These are, as yet, cultivated to a limited extent in this country. They are chiefly adapted to village gardens, or other grounds of limited extent, as they may be set as near each other as five or six feet. They may be easily covered with netting, and thus protected from the birds, and what is most rare and desirable, the fruit permitted to remain until fully ripe, so important to the flavor of all cherries of an acid character.

The stocks used for this purpose are the "Perfumed Cherry" or *Prunus Mahaleb*, which also possesses the advantage of flourishing on heavy clay ground. The grafts will usually grow quite vigorously for two or three seasons, but they soon form dwarf, prolific bushes; their branches being so pruned that seven, nine, or more, may come out from the centre of the plant, like a well-managed gooseberry bush. These branches will put forth, early in summer, as in the horizontal shoots of pyramidal pears, several shoots at their extremities, all of which must be pinched off to within two or three buds of their base, leaving the leading shoots untouched till near the close of summer, when they must be shortened to eight or ten buds. The Heart and Bizarreau cherries may be left of one-half greater length than the Dukes and Morellos, which are of smaller habit of growth; and where the space is small, the trees may be root-pruned and kept within a very limited space.*

* Rivers' Miniature Fruit Garden.

The cultivation of dwarf cherries would greatly facilitate the use of net screens for covering entire orchards, as sometimes practiced in Holland and England. The boundary fence is made of wire (or wood) lattice, so as to exclude small birds. At regular distances, through the enclosed area, are inserted into the earth, wooden or tile sockets for the reception of poles or props to support the net. These poles have a small circular board each nailed on their tops, to prevent injury to the netting. The boundary fence is supplied with hooks, to which the net is readily attached. When the cherries begin to ripen, it is elevated on several of the poles, each carried by a man, and spread over the garden, the rest of the poles being easily inserted in their sockets afterwards. All birds are thus completely excluded. During rain or dewy evenings, the net is stretched to its utmost extent, as indicated by the dotted lines in the annexed figure:

Fig. 266.



Birds excluded from miniature cherry orchard by net screen.

In dry weather, it is slackened, and forms a festooned vault over the whole cherry garden. Its durability is increased by soaking it in tan once a year.* Ten square rods of ground, comprised within a circle of fifty-nine feet in diameter, would contain forty dwarf cherry trees at eight feet distance, or ninety trees at five feet distance.

THE DISEASES AND ENEMIES,

To which the cherry is liable at the North, are few and not formidable. After the young trees are procured, they are consequently of remarkably safe and easy cultivation.

There are, however, some varieties which are liable to *black excrescences* on the branches, which, gradually increasing and extending, destroy the tree. The only means of arresting their progress, and which, when vigorously and

* Loudon's Sub. Hort.

unremittingly applied, does not fail, is to cut off the injured branches at once, and commit them to the fire.

The *black aphis*, or plant louse, is often very injurious to young trees in the nursery, causing a stunted and distorted growth, and when abundant on newly grafted trees, sometimes destroying them.

The best remedy is the application of whale-oil soap. A teacupful is dissolved in a pail of water, and applied with a syringe, or by the immersion of the infested branches, which causes the immediate death of the insects, and must be repeated every few days till no more are found.

The "*Cherry Slug*," (Fig. 267,) when in large numbers, does serious injury by eating the leaves. This animal, which appears to be the larva of an insect, is about half an inch long, and dark greenish brown when filled with food. Its smooth, shining, and jelly-like skin, and snail-like appearance, have given it the name "*Slug*." It may be repelled by dusting the cherry leaves regularly, while wet with dew, with dry fresh ashes.

Fig. 267.

The *curculio*, so destructive to the plum and apricot, sometimes injures young fruit. The *orchard caterpillar* often defoliates the cherry tree. Remedies have been pointed out in former chapters.

Sometimes the cherry crop is much lessened by long and *heavy rains*, at the period of the bursting of the anthers, washing down the pollen, and preventing the fertilization of the stigma and germ.

At the South and West, most of the finer varieties of the cherry do not flourish. This is supposed to be caused, at the South, by the hot sun upon the trunk of rapidly growing and succulent trees, the wood of which does not mature and harden sufficiently to withstand its effects. A partial remedy has been found in sheathing the trunks with straw. The Mayduke and a few other of the sour cherries, succeed best. Grafting upon these hardy sorts, may prove useful. A similar disaster is produced in many portions of the Western States, caused, perhaps, by severe frost in addition to the other named influences. On the fertile western soils, where the growth is very rapid, the outer and more horny portion of the bark does not expand fast enough, and firmly

binds the trunk, until suddenly ruptured by the increasing pressure. It usually bursts and cracks open on the south-west side, where the new growth swells out, and repeatedly bursting, the tree finally perishes. Slitting open the bark with a knife was found to produce this sudden swelling and increased growth at the precise lines where the slits were made, but afforded no relief at other places. It was only by shaving off evenly the whole surface of the hardened bark, that the unnatural cracking and swelling out was prevented.* Further experiments are needed in relation to this subject; possibly a softening application to the hard bark may be discovered; and it may also be very necessary where the outer portion is peeled or shaved off, to protect by a coating of straw, the denuded surface.

* J. B. Turner, in Horticulturist. A similar result, but evenly distributed over the surface, and accompanying healthy growth, occurs with all old and *rough-barked* forest trees, the exterior coating becoming gradually and evenly furrowed

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VARIETIES.

SYNOPSIS OF ARRANGEMENT.

DIVISION I. FRUIT HEART-SHAPED.

(Fruit inclining to sweet, tree vigorous and regular in growth.)

CLASS I. HEART CHERRIES.

(Flesh tender or half-tender.)

Sub-Class I. Fruit Black, dark red, or crimson,

Section I. Fruit large.
Section II. Fruit medium.
Section III. Fruit small.

Sub-Class II. Fruit bright red, or lighter.

Section I. Fruit large.
Section II. Fruit medium.
Section III. Fruit small.

Class II. Bigarreau Cherries.

(Flesh firm or rather hard.)

Sub-Class I. Fruit black, dark red, or crimson.

Section I. Fruit large.
Section II. Fruit medium.
Section III. Fruit small.

Sub-Class II. Fruit bright red, or lighter.

Section I. Fruit large.
Section II. Fruit medium.
Section III. Fruit small.

DIVISION II. FRUIT ROUND.

(Fruit rather acid, tree of irregular growth.)

Class I. Duke Cherries.

(Trees mostly upright, becoming partly spreading, fruit often approaching heart-shaped.)

Section I. Fruit large.
Section II. Fruit medium.
Section III. Fruit small.

Class II. Morello Cherries.

(Trees usually spreading, very irregular, shoots small, wiry, fruit nearly round.)

Section I. Fruit large.
Section II. Fruit medium.
Section III. Fruit small.

The two classes of the second division are not very distinctly separated; the chief distinction being in the growth of the tree. Most varieties of the first division are quite distinct;—a few, as the Madison Bigarreau, Downton, and White Bigarreau, possess intermediate qualities.

Season of Ripening. *Early*, as Black Tartarian, and American Heart; *medium*, as Graffion or Bigarreau, and Black Eagle; *late*, as Elkhorn and Downer's Late. Qualifying terms sub-divide and extend these periods.

DIVISION I. FRUIT HEART-SHAPED.

CLASS I. HEART CHERRIES.

Sub-class I. Fruit black, dark-red, or crimson.

Section I. Fruit large.

BLACK EAGLE. Rather large, obtuse heart-shaped, roundish, nearly black; stalk an inch and a half long, rather slender, slightly sunk; flesh dark, deep purplish crimson,

Fig 268. *May Bigarreau.* Fig. 269. *Knight's Early Black.*

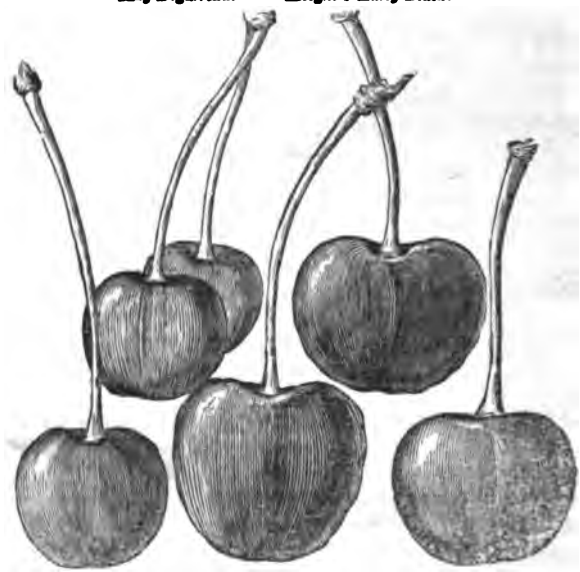


Fig. 270. *Early Purple Guigne.* Fig. 271. *Black Tartarian.* Fig. 272. *Black Eagle.*

with a very rich, high, excellent flavor. Season medium, (1st of 7 mo.) Shoots stout, diverging or spreading. A cross of the Graffion and Mayduke. English. Not always of the highest character.

BLACK TARTARIAN. (*Syn.* Frazer's Black Tartarian, Black Circassian, Black Russian, Ronald's Large Black Heart, Ronald's Heart.) Quite large, (often an inch in diameter,) on crowded old trees only medium; heart-shaped, often rather obtuse, surface slightly uneven, nearly or quite black; stalk an inch and a half long, slightly sunk; flesh dark, half tender, with a peculiar liver-like consistency, rich, nearly destitute of acid, of very fine, but not of the highest flavor. Ripens early, or about the middle of 6 mo., (June.) Shoots very erect. The vigorous growth and great productiveness of the tree and the large size and mild sweet flavor of the fruit, render this variety a general favorite.

KNIGHT'S EARLY BLACK. Large, obtuse, heart-shaped, surface slightly uneven, black; stalk an inch and a fourth or an inch and a half long, rather stout, cavity deep, narrow; flesh dark purplish crimson, tender, juicy, with a very rich, high, excellent flavor. Ripens quite early, or a little before the Black Tartarian. Shoots diverging or spreading. Much resembles the Black Eagle, but larger, earlier, more heart-shaped, and with *a much deeper cavity*. English. In some localities, it appears to need a rich soil and warm situation to develope its excellence.

Oxheart (of the English. Large, obtuse, heart-shaped, dark red, half tender, of second quality. Rare in this country. The name Oxheart is erroneously applied here to the White Bigarreau and to several large worthless sorts.

WATERLOO. Large, obtuse, heart-shaped, dark purple becoming black; stalk long, slender, flesh purplish red; flavor rich, sweet, and excellent. Rather late. Tree spreading, a moderate bearer. Spurious sorts are often disseminated under this name. English.

Section II. Fruit medium in size.

Black Heart. Medium or rather large; heart-shaped, slightly irregular; blackish crimson, becoming black; stalk an inch and a half long, moderately sunk, tender when ripe,

with a high, nearly first-rate flavor. Season medium or rather early. Productive and hardy; growth rather erect.

Manning's Early Black Heart, resembles the preceding in nearly all points, but is a week earlier.

Davenport's Early, closely resembles Black Heart, but is a few days earlier, and the leaves are larger and lighter green.

Early Purple Guigne. Size medium, round heart-shaped, distinctly dotted when ripening, dark red, becoming nearly black; flesh dark, tender, juicy, rich, sweet. Growth less vigorous than most heart cherries, shoots dark brown, spreading; leaves rather small, drooping on long petioles. Very early, ripening with May Bigarreau.

Gascoine's Heart. (*Syn.* Bleeding Heart, of Lindley.) Size medium, long heart-shaped, with a small, clear drop at apex, dark red, half tender, second-rate in flavor. A poor bearer. Season medium.

Section III. Fruit small.

Black Mazzard. (*Syn.* Mazzard, Wild English Cherry.) Small, oval heart-shaped, sides a little compressed; color, black; stalk long, slender, slightly inserted, flesh soft, bitter. Late. Valuable for stocks.

The White Mazzard, of Manning, nearly resembles the preceding except in its light color.

Black Corone. Rather small, round heart-shaped, dull black; stalk two inches long, slender, cavity narrow, deep; flesh dark crimson purple, tender when ripe, of second or third quality. Late. This is merely an improved Mazzard, intermediate between the common Mazzard and the Black Heart. The latter is sometimes cultivated under the name of Corone.

May Bigarreau. (*Syn.* Baumann's May of Downing, Bigarreau de Mai.) Rather small, oval heart-shaped, becoming as it ripens nearly round; color deep red, becoming black; stalk an inch and three-fourths long, rather stout at the ends, cavity narrow; flesh dark crimson, juicy,

rather sweet, not high-flavored. Very early. Productive. Shoots spreading, brown, resembling in color those of the Mayduke.

Sub-Class II. Fruit bright red, or lighter.

Section I. Fruit large.

DOWNTON. Large, round heart-shaped, apex quite obtuse, or slightly indented; light cream color, stained with red; stalk an inch and three-fourths or two inches long, slender; cavity wide; flesh yellowish, tender, adhering slightly to the stone, rich, delicious. Season medium or rather late. Growth rather spreading.

Ohio Beauty. Very large, oblate-heart-shaped; dark red on a pale red ground, somewhat marbled, very handsome; stalk an inch and a half long, rather stout, cavity wide and deep; flesh white, tender, juicy, with a fine flavor. Early, or about ten days before Napoleon Bigarreau, which it about equals in size. Origin, Cleveland, Ohio. New.

ROBERTS' RED HEART. Large, obtuse heart-shaped, bright red, cavity rather wide, flesh red, flavor excellent. Rather late. Origin, Salem, Mass.

Section II. Fruit medium in size.

American Amber. (*Syn.* Bloodgood's Honey.) Size medium, round heart-shaped, very regular, apex slightly sunk, skin thin, smooth, glossy; color light amber, becoming mottled and shaded with bright red; stalk two inches long, slender, slightly sunk; flavor pleasant, usually second-rate, sometimes very good, variable on the same tree. Productive. Season medium. Origin, Flushing. N. Y.

COE'S TRANSPARENT. Size medium, nearly globular, very regular; skin thin, pale amber, reddened in the sun, with peculiar pale spots, or blotches; stalk nearly an inch and a half long, moderately sunk, very tender, melting, sweet, excellent. Early, just before Black Tartarian. Growth, thrifty, upright. Origin, Middletown, Conn. New.

DOCTOR. Size medium, round heart-shaped; color light yellow and red, blended and mottled; stalk an inch and

a half long; cavity round, regular; flesh white, tender, juicy, sweet, fine. Very early. Resembles American Heart, but two weeks earlier. Growth moderate, spreading, leaves narrow. Origin, Cleveland, Ohio. New.

DOWNER'S LATE. (*Syn.* Downer, Downer's Late Red.) Size medium, round heart-shaped, smooth, red, light amber in the shade; stalk an inch and a half long, slightly

Fig. 273. *Coe's Transparent*

Fig. 274. *Early White Heart.*

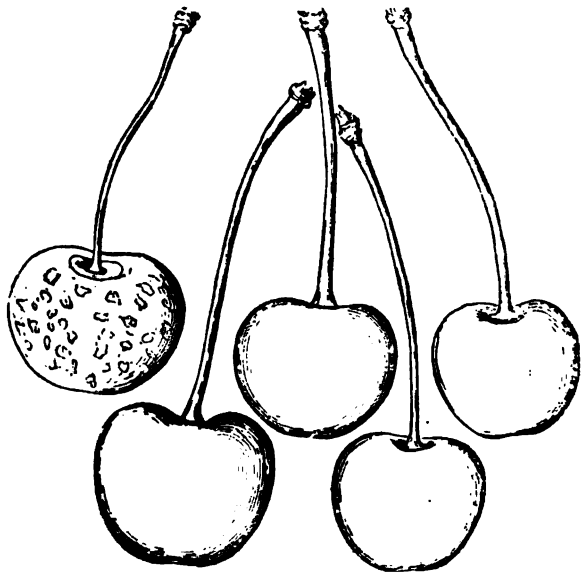


Fig. 275. *Downton.*

Fig. 276. *Downer's Late.*

Fig. 277. *Sparhawk's Honey.*

sunk; fruit in clusters; flesh tender, melting, rich, very high-flavored—not good till fully ripe. Late. Growth erect. Origin, Dorchester, Mass.

EARLY WHITE HEART. Medium, or rather small, heart-shaped, slightly oblong, often a little one-sided, suture distinct; color dull whitish yellow, tinged and spotted with pale red; stalk an inch and three-fourths long,

cavity wide, shallow; flesh rather firm, tender when ripe, sweet, pleasant. Quite early. Growth erect.

Bowyer's Early Heart, Arden's Early Heart, and Rivers' Early Amber, are either identical with the Early White Heart, or differ in no essential point.

Elliott's Favorite. Size medium, round, regular, slightly compressed; color pale amber yellow, with a bright, marbled, carmine-red cheek; stalk an inch and a half long, cavity even and regular; flesh pale amber, translucent, tender, delicate, juicy, with a sweet, fine flavor. Season medium, ripening with Belle de Choisy. Shoots vigorous, diverging. Origin, Cleveland, Ohio. New.

Hyde's Red Heart. Size medium, heart-shaped; color becoming a lively red, tender, pleasant. Shoots strong. New.

Manning's Mottled. (*Syn.* Mottled Bigarreau.) Medium or rather large, round-heart-shaped, suture distinct; color amber shaded and mottled with red; semi-transparent, glossy; stalk slender, cavity shallow; flesh yellow, tender when ripe, sweet, with a good flavor, often only second-rate. Stone rather large. Season, medium. Shoots dark. Productive. Origin, Salem, Mass.

Sparhawk's Honey. Medium in size, round-heart-shaped, regular; surface glossy, pale amber, becoming lively red; stalk an inch and a half long, rather slender, cavity round, even; flesh juicy, delicate, sweet, of fine flavor. Rather late. Very productive. Origin, Brighton, Mass.

Sweet Montmorency. Medium in size, round, slightly flattened at base, with a depressed point at apex; color pale amber, mottled with light red; stalk an inch and three-fourths long, slender, cavity small, even; flesh yellowish, tender, sweet, excellent. Season very late or past midsummer. Approaches somewhat in character the Morello. Origin, Salem, Mass.

White Tartarian. Size medium, or rather small; obtuse heart-shaped; skin pale yellow or cream color, not reddened by the sun; stalk an inch and a half long, slender; flesh somewhat pellucid, whitish yellow, half tender, with a second-rate, slightly bitter flavor.

There are several sorts known in this country as White Tartarian, differing from, and mostly superior to the genuine, the best of which, considerably cultivated in Western New-York, is of medium size or rather small, round-heart-shaped, light pink in the shade, darker to the sun; flesh tender, with a sweet, excellent flavor; a profuse bearer; growth rather slender, nearly erect.

Section III. Fruit small.

Amber Gean. Small, obtuse heart-shaped, regular, pellucid, pale yellow shaded with faint red, stalk long, slender, flesh white, sweet, pleasant; very productive; late.

Honey. (*Syn.* Late Honey, Yellow Honey, Large Honey.) Small, roundish oval, yellowish marbled with red, becoming deep amber red; stalk long, slender, scarcely sunk; flesh tender. exceedingly sweet; a second or third-rate variety. Quite late. Very productive.

Transparent Guigne. (*Syn.* Transparent Gean.) Rather small, ovate, slightly heart-shaped, regular; skin thin, glossy, pellucid, yellowish white, delicately blotched with pale red; suture distinct; stalk rather long, slender, slightly sunk; flesh high-flavored and fine, slightly bitter before ripe. Season rather late. Growth becoming spreading, tree productive.

Class II. Bigarreau Cherries.

Sub-Class I. Fruit black, dark red, or crimson.

Section I. Fruit large.

Large Heart-shaped Bigarreau. (*Syn.* Bigarreau Gros Cœuret, Bigarreau Gros Monstreux.) Large, heart-shaped, suture often a raised line; surface yellow, with red streaks, becoming blackish shining red; cavity shallow; flesh firm, purplish, bitter, becoming fine and rich; stone rather large. Late. French. Rare.

Manning's Late Black. Large, roundish, skin deep purple nearly black, flesh purplish, rather firm, moderately juicy and sweet. Late. Origin, Salem, Mass.

Elkhorn. (*Syn.* Tradescant's Black-Heart, Large Black Bigarreau.) Large, heart-shaped, surface slightly uneven, black, stalk rather short, or an inch and a fourth long, cavity rather deep; flesh solid firm, not juicy, with a high, fine flavor, bitter before fully ripe. Rather late. Shoots dark gray.

Section II. Fruit medium in size.

Black Bigarreau. Size medium, heart-shaped, black, resembling externally the Black Heart; flesh firm, rather dry, flavor poor. Rather late.

The Black Bigarreau of Savoy scarcely differs from this.

Gridley. (*Syn.* Apple Cherry.) Size medium, roundish, black; stalk rather short, cavity shallow; flesh purplish, firm, moderately juicy, rather high-flavored. Stone small. Late. Profusely productive, but only second-rate. Origin, Roxbury, Mass.

Wendell's Mottled Bigarreau. Medium or rather large, obtuse heart-shaped, dark red becoming nearly black, mottled with dark streaks or points; suture a dark line on one side; stalk medium; cavity round, regular; flesh firm, crisp, high-flavored; stone small. Rather late Growth upright. Albany, N. Y. New.

Sub-class II. Fruit bright red or lighter.

BIGARREAU OR GRAFFION. (*Syn.* Yellow Spanish White Bigarreau *of Mass.*) Very large, often an inch in diameter, obtuse heart-shaped, very smooth, regular, base flattened; surface clear, pale waxen yellow, with a handsome light red cheek to the sun; stalk an inch and three-fourths long, cavity very wide, shallow; flesh firm, with a fine, rich flavor. Season medium, or last of ; mo., (June.) Shoots stout, diverging or spreading. This variety, although not of the highest flavor, has become, from its great size, beauty, and productiveness, a general favorite.

The Late Bigarreau, originated with Dr. Kirtland, of Cleveland, resembles this, but is slightly less in size, deeper red, and ripens about ten days later

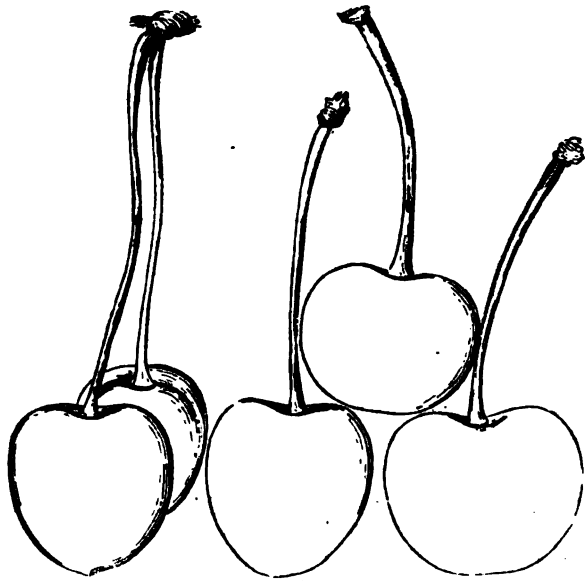


Fig. 278. *Elton.* Fig. 279. *Holland Bigarreau.* Fig. 280. *Florence.* Fig. 281. *Bigarreau or Graffion.*

CLEVELAND BIGARREAU. Very large, round-heart-shaped, suture broad and deep half way round; color, bright, clear, delicate red, or amber yellow; stalk an inch and a half long, curved; flesh firm, juicy, sweet, very rich. Season early, or with Black Tartarian, Resembles the Graffion, but ten days earlier. Origin, Cleveland, O New.

ELTON. Large, pointed, heart-shaped, somewhat oblong, pale yellow blotched and shaded with red; stalk two inches long, slender; flesh firm, becoming rather tender, rich, high-flavored, excellent. Season medium or rather early. Growth spreading, rather bending, petioles reddish purple. A cross between the Graffion and White Heart. One of the finest of cherries. English. Rather tender in very severe climates.

The Flesh-Colored Bigarreau, or the Large Heart-Shaped Bigarreau of Manning, the Bigarreau Couleur de Chair

of the French, very nearly resembles or is identical with the Elton.

FLORENCE. (*Syn.* Knevett's Late.) Large, heart-shaped, regular, smooth, amber yellow marbled with red, and with a red cheek; stalk an inch and a half long; flesh firm, juicy, sweet; season, rather late. Resembles Graffion, but hardly so large, and ten days later.

HOLLAND BIGARREAU. (*Syn.* Spotted Bigarreau.) Large, rather oblong-heart-shaped, apex somewhat pointed; surface whitish in the shade, mottled and spotted red next the sun; stalk an inch and a half long, slender, cavity large and deep; fruit in thick clusters; flesh firm, sweet, fine, but not of the highest flavor. Season a little before medium. Leaves large and broad.

KIRTLAND'S MARY. Quite large, round heart-shaped, regular, base somewhat flattened; color light and dark red, deeply marbled, on a yellow ground; stalk an inch and a fourth to an inch and a half long; flesh light yellow, half tender, rich, juicy, sweet, high-flavored. Season medium, or with the Elton. Origin, Cleveland, Ohio. New.

Large Red Bigarreau. Large, oblong-heart-shaped, surface uneven, one side swollen, shoulders projecting, sutures distinct; stalk large, cavity large and deep; skin yellowish, dotted and streaked with red in the shade, dark red in the sun; flesh yellowish, red at the stone, firm, rich, of fine flavor. Rather late. Growth very strong. French. Rare.

NAPOLEON BIGARREAU. Very large, regularly heart-shaped, remotely oblong; skin pale yellow and amber, spotted and shaded with deep red; stalk very short, an inch and a fourth long; flesh very firm, with a fine but hardly first rate flavor. Rather late. Shoots with a light greenish cast. Growth rather erect, vigorous. Very productive, and good for market, but too firm and deficient in flavor for the small garden.

ROCKPORT BIGARREAU. Quite large, round heart-shaped; color, when fully ripe, a beautiful clear red, shaded with pale amber, with occasional spots; stalk an

inch and a half long, cavity wide; flesh firm, juicy, sweet, rich, with an excellent flavor. Season rather early. Tree upright, vigorous. Origin, Cleveland, Ohio; one of the best of Dr. Kirtland's new seedlings.

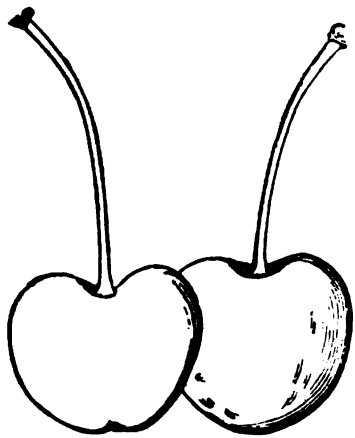


Fig. 278—*Rockport Bigarreau.* Fig. 279—*Napoleon Bigarreau.*

White Bigarreau. (*Syn.* Large White Bigarreau, White Ox-Heart.) Large, heart-shaped, tapering to obtuse apex; suture distinct; surface slightly wavy, yellowish white marbled with red; flesh moderately firm, or half tender, very rich and delicate. Season medium. A moderate bearer when young, more productive afterwards; liable to crack after rain; tree rather tender; growth spreading.

Section II. Fruit medium in size.

American Heart. Medium, or rather large, rectangular heart-shaped; color, light red or pink, mixed with amber; stalk nearly two inches long, slender, cavity small and shallow; flesh half tender, adhering to the rather tough skin, juicy, sweet, fine, hardly first rate. Very productive. Early.

F. R. Elliot says that the *Swedish* resembles the American Heart, but ripens with the Mayduke.

Burr's Seedling. Size medium, or rather large, distinct heart-shaped, smooth, a fine deep clear red, often spotted or marbled, stem an inch and a half long, cavity moderate; flesh half-tender, (about as firm as American Heart, from which it probably originated,) sweet, rich, with a fine flavor. Growth vigorous, very productive. Season, medium. Origin, Perrinton, N. Y. New.

Buttner's Yellow. Medium in size, roundish, somewhat obtuse-cordate, base distinctly flattened; surface clear pale yellow, not reddened by the sun; stalk short, flesh yellowish, firm, crisp, sweet, good; stone quite small. Late. Growth vigorous. Origin, Halle, Germany.

China Bigarreau. Medium in size, oval-heart-shaped, somewhat roundish, suture distinct; color, amber mottled with red, becoming red; stalk long, slender, cavity shallow; flesh half-tender when ripe, with a rather rich and peculiar, second rate flavor. Season, rather late. Shoots spreading. Origin, Flushing, L. I.

Downing's Red Cheek. Size medium or rather large, obtuse heart-shaped, regular, suture distinct; color with a broad crimson cheek; stalk an inch and a half long, cavity of medium size; flesh half tender, delicate, sweet, rich, nearly first rate. Rather early. Origin, Newburgh, N. Y.

Hildesheim. (*Syn.* Hildesheim Bigarreau, Bigarreau Tardif de Hildesheim.) Size medium; heart-shaped; color, yellow mottled and marbled with red; flesh yellow, firm, sweet, agreeable. Very late. German.

Lady Southampton's Yellow. Size medium, heart-shaped, yellow with no tinge of red, flesh firm, not juicy, flavor rather poor. Late.

Madison Bigarreau. Size medium, regular heart-shaped amber yellow, dotted and marbled with red; stalk rather short, slender; flesh half-tender, sweet, pleasant, of fine flavor. Season medium or rather early. A good bearer. Shoots spreading. Origin, Salem, Mass. Flesh almost too tender to be included with the bigarreaus.

Section III. Fruit small.

Remington. (*Syn.* Remington White Heart.) Small, heart-shaped, yellow, rarely a faint red-cheek, rather dry, bitter, worthless. Ripens about the end of summer or early in autumn, its lateness being its only recommendation. Origin, Rhode Island.

DIVISION II. FRUIT ROUND.

Class I. Duke Cherries.

Section I. Fruit large.

Arch Duke. (*Syn.* Portugal Duke, Late Arch Duke.) Very large, round-heart-shaped, slightly flattened, dark shining red, becoming nearly black; stalk an inch and a half long, slender, deep-sunk; flesh light red, when matured rich, sub-acid, slightly bitter till fully ripe, of fine flavor, hardly equal in quality to Mayduke. Season very late, or just before midsummer. One fourth larger than Mayduke, and tree more spreading, and with thicker and darker foliage. Rare.

Belle Magnifique. Quite large, roundish, inclining to heart-shaped; color a fine rich red, portions of the surface often a lighter hue; stalk slender, nearly two inches long, cavity large; flavor rather mild for this class, fine, but not of the highest quality. One of the best late varieties, ripening about midsummer. Productive. Growth resembles that of the Mayduke in form. French.

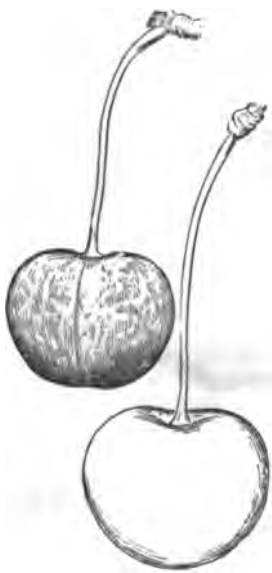


Fig. 280.—*Belle de Choisy.* Fig. 281.—*Belle Magnifique.*

Belle de Choisy. Size medium, round, very even, obscurely oblate; skin thin, translucent, showing the netted texture of the flesh; stalk rather short, slender; flesh pale amber, mottled with yellowish red, becoming in the sun, a fine cornelian red; flesh very tender, very juicy and melting, with a fine mild, sub-acid flavor, becoming nearly sweet; season rather early. Moderately productive; needs good cultivation. French.

Late Duke. Large, obtuse roundish heart-shaped, slightly oblate; color light, mottled with bright red at first, becoming rich dark red when ripe; stalk an inch and a half long, rather slender, cavity shallow; flesh pale amber, sub-acid, not rich, much less so than Mayduke; season very late, or a little after midsummer. Tree more spreading than Mayduke, and foliage rather more compact, approaching somewhat the character of a Morello.

Le Mercier, a new French variety, resembles Late Duke, and ripens at the same time—it is roundish, remotely heart-shaped, obtuse; suture shallow, ending in a point at apex; surface light shining red, marbled with deeper red—about second-rate.

MAYDUKE. Large, roundish, obtuse heart-shaped; color red at first, becoming when mature nearly black; flesh reddish, becoming dark purple, very juicy and melting, rich, acid, excellent. It is frequently picked when red immature, and not fully grown, and imperfect in flavor. Quite early—but often varying greatly and permanently in its season of ripening, even on the same tree. Holman's Duke and Late Mayduke are only late variations perpetuated by grafting. Growth upright for a Duke. Very hardy, and adapted to all localities.

ROYAL DUKE. (*Syn.* Royal Tardive.) Very large, roundish, distinctly oblate, surface dark red; flesh reddish, tender, juicy, rich; season rather late. Growth like the Mayduke. Rare.

Much confusion has existed relative to the different Duke cherries. Most of the sorts disseminated in this country are only sub-varieties of the Mayduke. The Arch Duke and the Late Duke are distinguished by their *spreading branches;* and the Mayduke and Royal Duke by their more *upright* or *fastigiate growth.* The Late Duke is distinguished from the Arch Duke, by its more oblate fruit, and from the Mayduke by its late maturity and paler flesh. The Royal Duke is remarkable for its distinct *oblate* form.

Section II. Fruit medium in size.

Jeffrey's Duke. (*Syn.* Jeffrey's Royal, Royale.) Size medium, round, obscurely oblate; color a fine lively red; stalk medium; flesh amber with a tinge of red, rich, juicy, of fine flavor. Growth slow, very compact, fruit in thick clusters; season medium. Resembles Mayduke, but smaller, rounder, and lighter colored. Rare in this country.

Class II. Morellos.

Section I. Fruit large.

Carnation. Large, round, yellowish white, mottled and marbled with fine orange red; stalk an inch and a fourth long, stout; flesh slighty firmer than most of this class, a little bitter at first, becoming mild acid, and with a rich fine flavor; growth spreading; leaves resembling those of a heart cherry. Very late, ripening about midsummer.

Prince's Duke is a large sub-variety, but a very poor bearer and of little value,

Morello. (*Syn.* English Morello, Large Morello, Dutch Morello.) Rather large, approaching medium; round, obscurely heart-shaped; dark red, becoming nearly black flesh dark purplish crimson, of a rich acid, mixed with a slight astringency. Season very late, or after midsummer. In England, its ripening is retarded till autumn by the shading of a wall. Rare in this country.

The common Morello is a smaller sub-variety, a little darker and with smaller branches.

Plumstone Morello. Large, roundish-heart-shaped; color deep red; stalk an inch and a half long, slender, straight; cavity moderate; flesh reddish, of a rich acid flavor. Very late, or after midsummer. Stone rather long and pointed. The most valuable of the Morellos.

Rumsey's Late Morello. Large, round heart-shaped, smooth, polished, light red, becoming a lively red; suture distinct; stalk an inch and a half long, cavity rather nar-

row and deep; flesh juicy, very acid, stone like the Plum-stone Morello. Very late, ripening at the end of summer and beginning of autumn. Too sour for the table, culinary only. Origin, Fishkill, N. Y. New.

Section II. Fruit medium in size.

Buttner's October Morello. Size medium, round, flavor very acid, one of the latest cherries, ripening in autumn, and unworthy of cultivation. Dutch. New.

Flemish. (*Syn.* Montmorency *of Lind.*) Size medium, distinctly oblate, bright red, usually in pairs, stalk very short or three-fourths of an inch long, cavity deep, furrowed on one side; sub-acid, flavor moderate. A poor bearer. Very late.

Kentish. (*Syn.* Early Richmond, Virginian May, Kentish Red, English Pie Cherry.) Rather small becoming medium when well ripened, round, slightly oblate, growing in pairs; color a full red; stalk an inch or an inch and a fourth long, rather stout; flesh very juicy, acid, moderately rich. Stone adhering strongly to the stalk, often withdrawing it from the fruit when picked. Very productive; fine for early cooking, ripens early and hangs long on the tree.

Pie Cherry, (American.) (*Syn.* Late Kentish of Downing, Common Red, American Kentish.) Size medium, approaching small, roundish, slightly oblate; stalk an inch to an inch and a half long, stout; color light red; flesh very juicy, quite acid, moderately rich. Rather late. Stone not adhering to the stalk, as with the preceding. Very productive; a good culinary sort.

Section III. Fruit small.

Cluster. (*Syn.* Cerise à Bouquet.) Small, in clusters of two to six on a common peduncle; round, red, quite acid rather late. Of little value. Tree small.

Early May. (*Syn.* Cerise Indulle.) Small, round, approaching oblate, bright high red; stalk an inch long; flesh juicy, acid, good. Very early.

CHAPTER VIII.

THE GOOSEBERRY AND CURRANT.

THE CURRANT, from its hardiness, free growth, easy culture, great and uniform productiveness, pleasant flavor, and early ripening, is one of the most valuable of our summer fruits.

It is propagated, like the gooseberry, from cuttings, for which vigorous shoots of the last year's production should be chosen. Half the buds only at the top of the shoot, should be left; and the plants may be kept trained up to a single stem, a few inches high, when the branches should radiate on all sides in an upward direction so as to form a handsome spreading top. Currant bushes, if permitted to sucker moderately, will however endure for a longer time, as the new shoots, sending out roots of their own, afford in fact a spontaneous renewal. But care is needed that they do not form too dense a growth.

Currants, from their hardiness, usually receive no attention nor culture, but are suffered to become overrun with weeds and grass, and to become crowded with a profusion of suckers. Small and inferior fruit is the result. A great improvement both in size and quality, is made by rich soil, good cultivation, and judicious pruning. The difference in flavor between fruit ripened on well trimmed branches, with air and sun freely admitted to the fully grown leaves, and that which is shaded by a crowded growth of foliage, is greater than most who have not witnessed the experiment would believe.

The various modes of using, drying, and preserving currants, in tarts, jellies, &c., are familiar to all; the following mode, by which the green fruit may be kept for any length of time, in as good condition as when gathered, may

prove useful: Pick the fruit when fully grown, dry the surface well without shrivelling, and cork tight in glass bottles, covering the corks with sealing wax; then bury the bottles to the neck in sand or earth in a cool cellar. This method may be successfully applied to the gooseberry.

VARIETIES.

Class I. Red and White Currants, (Ribes rubrum.)

Champagne. Size medial, pale pink, quite acid, not of high flavor; a curiosity.

Cherry Currant. Very large, nearly twice the size of the common Red Dutch, round, light red, clusters moderately short, quite acid. Growth large, tall, and luxuriant. Rather unproductive. Italy. New.

Dutch, Red. A little larger than the common red currant, and clusters much longer, and a little less acid. Probably the best red currant.

Dutch, White. Nearly resembles the common white currant, but with longer clusters, and with fruit less approaching oblate. The best white.

Knight's Early Red. It ripens ten days earlier than the other sorts, which comprises its merit.

Knight's Sweet Red. Less acid than most varieties, and rather less so than the White Dutch—paler in color than the common red.

May's Victoria. Rather large, scarcely larger than Red Dutch. flavor rather acid—hangs long, and valuable for its lateness. Rivers says it is undoubtedly the same as *Goliath*, "an excellent late currant."

Striped Fruited. Striped with white and red — rare. Germany.

White Grape Currant. Quite large, rather larger than White Dutch, bunches shorter, and hardly equal in flavor.

Class II. Black Currants, (Ribes nigrum.)

Common Black or Black English. Large, one third of an inch in diameter, quite black; clusters very short; with a strong odor, flavor poor.

Black Naples. Largest of all currants, sometimes five-eighths of an inch in diameter, resembling in flavor the preceding, but ripening later, and with larger clusters. The largest currant known. Sometime used for jellies.

THE GOOSEBERRY.

The Gooseberry,* as mostly cultivated in this country, is a native of the North of Europe. The American species have very rarely or never been improved by cultivation. The foreign species has been multiplied into thousands of varieties in England. The catalogue of the London Horticultural Society enumerates 149 sorts worthy of notice, and Lindley gives a list of more than 700 prize sorts. Large numbers of these are, of course, distinguished by the slightest distinctive shades. Some, by the most perfect culture, with pruning, and thinning the fruit on the branches, have been made to attain a diameter of two inches, and a weight of an ounce and a half. But such mammoth sorts are usually neither so good in flavor nor so profitable for raising as those of a medium size.

The productiveness of the gooseberry, under good management, is very great. The Whitesmith and some other varieties frequently bear so copiously, that the fruit is strung along the branches in actual contact, for several inches together. Finer fruit, it is true, may be had by thinning, when the berries are yet small; and the exhaustion is less than when the bushes are heavily laden.

Some instances of great productiveness are given by B. G. Boswell, in the Horticulturist. In one instance, a gardener near Philadelphia, gathered from two rows, one hundred and fifty feet long, six bushels, which sold for twenty-four dollars; and another cultivator in the same neighborhood, gathered thirteen quarts from a single plant.

* Supposed to have been formerly much used as a sauce with green goose, whence its name.

Propagation and Culture. The Gooseberry is propagated from cuttings, in a manner quite similar to the currant. The soil should be a good strong loam, and made unusually deep by trenching, to secure the bushes from drought. It should be kept fertile by application of manure. The pruning should be freely performed as soon as the leaves are off, by a thorough thinning out of the branches. The shoots should be left, evenly distributed over the bush, so as to prevent crowding of the leaves, for it must be remembered that with this as well as with all other plants or trees, the growth and ripening of the fruit *depends wholly on the admission of light and air to the* LEAVES, *and on their full and healthy development.*

Mildew. This is the most serious obstacle to the successful cultivation of the gooseberry in the United States. In the cool and moist climate of England, it does not exist; in the extreme northern parts of the Union, it is not formidable; but on approaching the Middle States, although the bushes grow vigorously and set abundant crops of young fruit, the latter become covered with a thick brown or grey mildew or scurf, which wholly destroys their value.

Manuring, high cultivation, and pruning, will in some cases prove sufficient to prevent mildew. This may be assisted by the cautious application of salt,—either thinly over the soil, or directly upon the plant; in the latter case, the solution should be so thin, that the saline taste may be just perceptible. But shading by a thick coat of salt hay, appears to be the most efficient remedy. It should be spread in a layer of several inches or even a foot in thickness, crowding it down to make room for the branches. This should be done in spring. It has proved quite successful in a multitude of instances, even as far south as Delaware. In inland districts where sea-weed or salt hay cannot be had, a convenient substitute consists in placing coarse hay or straw beneath the bushes, and then applying a solution of salt with a watering pot, avoiding direct contact with the bushes, if the solution be strong.

VARIETIES.

A few only can be mentioned within the present limits, out of a vast assemblage of hundreds. Most of the fine English sorts have either been tried here to a very limited extent, or not tried at all; but among a few which have proved particularly successful, the following may be mentioned:—

CROWN BOB. (*Syn.* Melling's Crown Bob.) Large, often an inch and a fourth long, roundish oval, red, hairy, flavor of first quality; branches spreading or drooping.

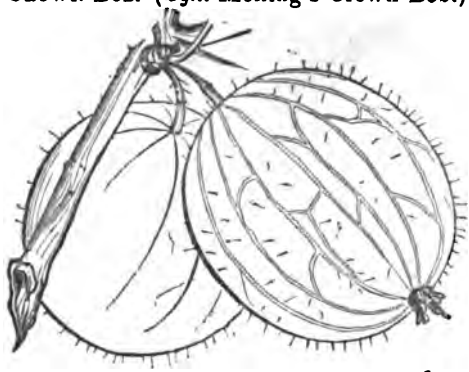


Fig. 282—*Crown Bob.*

ROARING LION. (*Syn.* Farrow's Roaring Lion.) Very large, oblong oval, red smooth; flavor fine, hangs long, branches drooping.

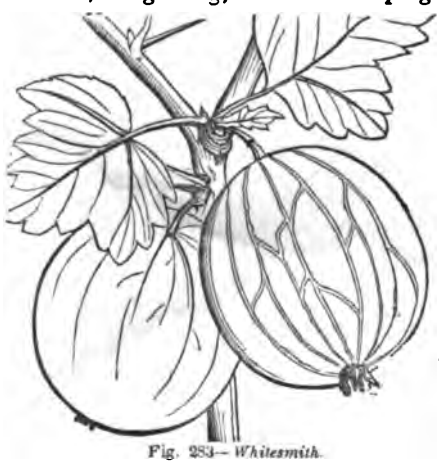


Fig. 283—*Whitesmith.*

WHITESMITH. (*Syn.* Woodward's Whitesmith.) Rather large, a little over an inch long roundish oval, slightly approaching oblong, yellowish white, very slightly downy, flavor of first quality; branches rather erect.

RED WARRINGTON. Rather large, roundish oblong, hairy; flavor of

first quality. Hangs long without cracking, and improves in flavor. Branches drooping.

PARKINSON'S LAUREL. Large, obovate, green, downy, flavor of first quality; branches rather erect.

WELLINGTON'S GLORY. Large, rather oval, very downy, skin quite thin; flavor excellent; branches erect.

HOUGHTON'S SEEDLING. Fruit small, oval, commonly about three-fourths of an inch long; skin smooth, thin, glossy, a pale, dull reddish brown, marked with faint greenish lines; flesh tender, juicy, sweet, pleasant. Ripens soon after midsummer. Not high-flavored, as compared with the best European sorts, but a profuse bearer, always free of mildew, and of very easy cultivation. A seedling from a wild American species; origin, Salem, Mass.

Fig. 284—*Houghton's Seedling.*

CHAPTER IX.

THE RASPBERRY.

Propagation. Most varieties are increased with great facility by suckers; a few, as the American Black and American White, are propagated readily by layers, the tips of the recurved branches when slightly buried, soon taking root. New varieties are raised from seeds, and come into bearing the second year.

The soil for the raspberry should be rich and approaching moist, and an admixture of swamp muck is useful. A strong deep loam, is the only soil from which a full crop may be expected every season. If sandy or gravelly, or a stiff, cold clay, it cannot be relied upon. But the most important requisite is *d·p'h*, only to be attained by deep trenching, and which will go far towards affording a remedy for any natural defect of the soil. The most tender varieties, as the White Antwerp, may be raised on higher, drier and firmer spots of ground, being there less liable to severe frosts in cases where winter covering cannot be applied.

The culture is simple. It consists in pruning each spring, keeping all weeds and grass well cleared away from the stems, and the soil mellow and clean by cultivation.

The pruning should be done early in spring. It consists in cutting out all but the last year's growth, together with all the smaller shoots, even with the ground, leaving only five or six of the last summer's canes for future bearing. These are to be cut off three or four feet high, and neatly tied together, using a stake to stiffen them if necessary. In tying, they should be allowed to spread slightly at the top, in the form of a wine glass. The distance asunder should be about four feet.

The accompanying figures exhibit a mode of training the raspberry recommended in the Gardener's Chronicle. In fig. 285, representing the appearance in autumn, the arched

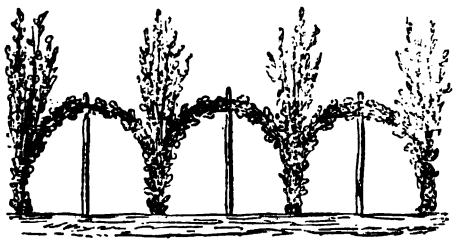


Fig. 285

portions, tied to the stake in the centre, are the canes which have borne fruit, and which must be cut down to the ground, to be replaced by the upright which have just completed their growth, and which are to be trained in the manner represented by fig. 286.

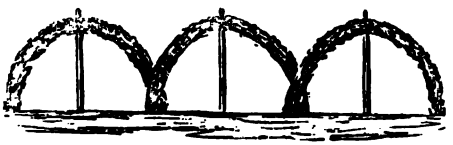


Fig. 286.

In many parts of the Northern States, some tender varieties, and more especially the White Antwerp, need winter protection. This is easily given, by covering the stems, when prostrate, very thinly with earth; placing a small mound of earth against the bottom of the stems before laying them down, to bend upon and prevent breaking. This covering is removed early in spring. It will be found to prove very useful, even when not necessary to prevent winter-killing, by rendering the crop larger and more certain.

A plantation of raspberries will continue in bearing five or six years, when it should be renewed. If it remain longer, the fruit becomes small, and the crop gradually declines.

VARIETIES.

American Black. (*Syn.* Thimble-berry, Common Black cap.) Rather small, hemispherical, flavor rich, sub-acid. Rather late. Shoots long, purple, recurved.

The *American White* is similar in all respects, but with light yellow fruit and shoots.

American Red. (*Syn.* Common Red.) Size medium, roundish, light red, sub-acid; shoots vigorous, long. Rather early.

Barnet. Very large, roundish-conical, bright purplish-red, flavor rich, agreeable; canes long, yellowish green, much branched, when young very bristly towards the top.

Fig. 287.—*Col. Wilder.*

COL. WILDER. (*Syn.* Cushing.) Very large, roundish, slightly conical, cream-colored, semi-transparent; flavor fine. Growth very vigorous, quite hardy, productive, ripening early, and for several successive weeks. New; raised by Dr. Brinckle, of Philadelphia, from seed of the Fastolff.

Cretan Red. Size medium, roundish-conical, deep purplish red, sub-acid, good; canes rather upright, grey, nearly smooth; leaves light-colored. Rather late. Productive, and succeeds well on light soils.

FASTOLFF. Very large, obtuse, conical, somewhat roundish, bright purplish red, rich, high-flavored. Rather larger than Red Antwerp, more obtuse, softer, and hardly so high-flavored. Canes rather erect, branching.

FRANCONIA. Very large, rather firm, obtuse-conical, dark red, flavor rich, sub-acid; canes strong, spreading, branching, yellowish brown. Leaves rather narrow. A few days later than Red Antwerp. Productive. Hardy.

Ohio Everbearing. Resembles, in all respects, the American Black, except in a continued succession of fruit till mid-autumn.

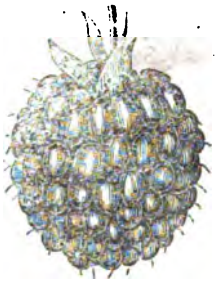


Fig. 288.—*Fastolff.*

Fig. 289.—*Red Antwerp.*

RED ANTWERP. (*Syn.* True Red Antwerp.) Very large, conical, dull red; flavor rich and sweet. Canes moderately strong, yellowish green, becoming pale brown, prickles not numerous. Ripens about midsummer.

An inferior sort, of smaller size, is disseminated under this name—it is distinguished from the genuine by its round, obtuse form, while the true is somewhat conical and pointed.

In southern Virginia and Carolina, the Antweps fail from the heat of the sun.

Yellow Antwerp. (*Syn.* White Antwerp.) Quite large, conical, often long-conical, light yellow, with fine bristles; flavor very rich and excellent. Rather tender—needs winter protection at the north, which renders it less valuable than some other sorts of no better flavor.

CHAPTER X.

THE STRAWBERRY.

THE cultivation of this early and delicious fruit, so universally esteemed, is much neglected through the country at large. Failure from bad management has doubtless contributed to this neglect.

The requisites for success, are chiefly,

1. A good, deep, rich soil;
2. Clean cultivation between the rows;
3. A renewal by planting as often as once in three years;
4. Selection of suitable varieties.

Soil. Any deep, rich soil, which will afford fine crops of corn and potatoes, is well adapted to the cultivation of the strawberry. To be uniformly productive, it must be deeply trenched, either by the spade or by double plowing, and well enriched with manure. Fine crops, it is true, may be obtained without trenching, but not in such excellence, profusion, nor certainty, in all seasons. It rarely, but sometimes happens that the soil is made too rich. The usual error is the reverse.

Clean Cultivation is a most essential requisite. On a large scale, it may be very cheaply accomplished by a horse and cultivator, the rows being about two feet apart, and the plants a foot to a foot and a half in the rows. The runners must be kept down by hoeing, or treated precisely as *weeds*; and unless the soil is already quite fertile, a dressing of manure should be applied each autumn, which will protect the roots, soak into the soil, and may be turned under in spring. A light top-dressing of leached ashes is highly beneficial to strawberry beds.

Some varieties, as the Large Early Scarlet and Dundee, will often bear profusely for a single season, even when the plants run thickly together; others, and more particularly

the larger sorts [redacted] cleared of runners and kept well cultivated, o[redacted] always bear poorly.

A renewal of the beds by transplanting, is performed most successfully in spring. The new plants, formed by the rooting of the runners, are always the best. Planting in summer requires much care and labor in watering; and in autumn, the plants rarely become so well rooted as to withstand sufficiently the frosts of winter.* In all cases, the roots, before set out, s[redacted] be immersed in mud, and the plants watered afterwards.

The following very easy mode of raising the strawberry, by a spontaneous renewal of the plants, or "culture in alternate strips," is thus described by A. J. Downing, and has been successfully practiced in various parts of the country:—

"Early in April, or in August, being provided with a good stock of strong young plants, select a suitable piece of good deep soil. Dig in a heavy coat of stable manure, pulverizing well and raking the top soil. Strike out the rows, three feet apart, with a line. The plants should now be planted along each line about a foot apart in the row. They will soon send out runners, and these runners should be allowed to take possession of every alternate strip of three feet—the other strip being kept bare by continually destroying all runners upon it, the whole patch being kept free of all weeds. The occupied strip or bed of runners will now give a heavy crop of strawberries, and the open strip of three feet will serve as an alley from which to gather the fruit. After the crop is over, dig and prepare this alley or strip for the occupancy of the new runners for the next season's crop. The runners from the old strip will now speedily cover the new space allotted to them, and will perhaps require a partial thinning out to have them evenly distributed. As soon as this is the case, say about the middle of August, dig under the whole of the old plants with a light coat of manure. The surface may be then sown with turnips or spinage, which will come off before the next season of fruits.

"In this way the strips or beds occupied by the plants, are reversed every season, and the same plot of ground may thus be continued in a productive state for many years."

* When autumn planting is adopted from necessity, the soil should be closely trodden round the roots to prevent heaving by the frozen moisture.

Selection of Varieties. Independently of fine quality, the selection of suitable varieties is of great importance. Some sorts, celebrated and highly recommended, will not yield a tenth part of the crop afforded by others. The most productive, among which may be mentioned the Cincinnati Hudson,* the Large Early Scarlet, and the Dundee, have yielded at the rate of 50 to 70 and sometimes 100 bushels per acre; the ground, at the period of ripening, glowing with the dense red clusters which nearly cover the surface; while of such varieties as Swainstone's Seedling, Myatt's Eliza, and Deptford Pine, the fruit is so thinly scattered and imperfect, that whole square feet are destitute of fine specimens.

As the productive qualities of strawberries depend so essentially on the presence of the *stamens* and *pistils*, some attention to this part of the subject becomes indispensible to their successful culture.

Modern cultivators divide all strawberries into two distinct classes, one being termed *staminate*, (or "male,") in which the stamens are fully developed, and possess the power of fertilizing the germ; and the other being termed *pistillate*, (or "female,") in which the stamens are abortive, or so small and imperfectly developed that they fail to accomplish fertilization. The above figures, (figs, 290 and 291,) represent the usual appearance of these

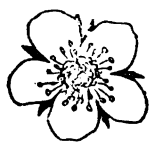


Fig. 290.
Staminate flowers

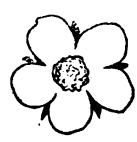


Fig. 291.
Pistillate flowers.

Fig. 292.
Pistillate flower, magnified.

Fig. 293.
Staminate flower, magnified.

two kinds of flowers; and figs. 292 and 293, magnified portions of the same, fig. 293 exhibiting a part of the flower of the Large Early Scarlet, and fig. 292, the same of Ho-

* A single cultivator in Kentucky, who supplies Cincinnati, and who has sixty acres planted with strawberries; carried in one season to market, from thirty-seven acres, one hundred and twenty bushels per day, for eight or nine successive days. The whole amount sold in Cincinnati, during 22 days in the year 1846, was 4,150 bushels, being an average of nearly 200 bushels per day.

vey's Seedling; *a*, being the stamens, and *b*, the pistils. By the use of a microscope it will be found that the former is abundantly supplied with pollen or fertilizing dust, while the latter is nearly or totally destitute. Hence Hovey's Seedling or any other pistillate variety, can never, or but very imperfectly, fertilize its own flowers, and the impregnation must be derived from a staminate sort.

Strictly speaking, the term *staminate* applies to those only which are destitute of perfect pistils. Very few flowers, however, are wholly destitute; and most of those which have perfect stamens, have also a greater or less number of pistils, but usually much fewer than the pistillate flowers only. This imperfection in the pistils of staminate sorts, render those sorts usually unproductive.* Hence the greatest bearers are mostly of the pistillate varieties, fertilized by staminate sorts planted within a few feet for this purpose. Without this assistance, derived from staminate flowers, pistillates are either barren, or the fruit is imperfect and distorted, only a part or the outer portion of the berry nearest the stamens, being impregnated by the scanty supply of pollen from the nearly abortive stamens.

In planting strawberry beds, it is important, therefore, to know the character of the flowers. Nothing is easier than to distinguish the two when in blossom. This distinction is given in the *arrangement of varieties* which follows. About one quarter staminates are usually regarded as abundant for fertilizing a bed. To prevent intermixture of the two sorts by runners, they may be planted in alternate strips, as indicated by the following diagram, S representing staminate, and P pistillate varieties:

P	P	P	P		S		P	P	P	P		S		P	P	P	P		S	S	S	S
P	P	P	P		S		P	P	P	P		S		P	P	P	P		S	S	S	S
P	P	P	P		S		P	P	P	P		S		P	P	P	P		S	S	S	S
P	P	P	P	*Path.*	S	*Path.*	P	P	P	P	*Path.*	S	*Path.*	P	P	P	P	*Path.*	S	S	S	S
P	P	P	P		S		P	P	P	P		S		P	P	P	P		S	S	S	S
P	P	P	P		S		P	P	P	P		S		P	P	P	P		S	S	S	S
P	P	P	P		S		P	P	P	P		S		P	P	P	P		S	S	S	S

* There are a few exceptions to this general rule, as in case of the Large Early Scarlet, which, although most conspicuously a staminate, is a profuse bearer. The Alpine and Wood Strawberries have perfect flowers and are good bearers.

VARIETIES.

Class I. Scarlet Strawberries.

(Flowers small; leaves rather long, thin, and light green, sharply serrate; fruit bright color, acid or sub-acid, seed deeply sunk. *Fragaria virginiana.*)

Section I. Flowers Staminate.
Section II. Flowers Pistillate..

Class II. Pine Strawberries.

(Flowers rather large, leaves broad, dark green, sometimes obtuse; fruit large, not acid, rather smooth, seeds little sunk *Fragaria grandiflora.*)

Section I. Flowers Staminate.
Section II. Flowers Pistillate.

Class III. Alpine and Wood Strawberries.

(Flowers rather small, perfect; leaves small, thin, light green; fruit small, sweet, parting freely from the calyx. *Fragaria vesca.*)

Class IV. Hautbois Strawberries.

(Leaves large, pale green, on tall stalks*; fruit-stalk tall and erect; fruit dull purplish. *Fragaria elatior.*)

Class V. Chili Strawberries.

(Leaves very hairy, thick, obtusely serrate; fruit very large, pale, insipid. Tender *Fragaria chilensis.*)

Class VI. Green Strawberries.

(Leaves light green, plaited; flesh solid. Of little value.)

Class I. Scarlet Strawberries.

Section I. Flowers Staminate.

Downton. (*Syn.* Knight's Seedling.) Rather large, necked, ovate or coxcomb-shaped, often oblate, dark purplish scarlet, flesh firm, rich, aromatic; unproductive. Valueless. English.

Duke of Kent. (*Syn.* Austrian Scarlet.) Small, varying from roundish without a neck, to long conical and necked; bright scarlet, a clear rich acid. Earliest of all strawberries,—ripe the first day of summer. Usually staminate, but the earlier flowers sometimes pistillate only.

* Whence the name *hautbois*, meaning, literally, in French, high-wood.

Elton. Large, ovate, often coxcomb-shaped, glossy, light red, becoming dark red, flesh red, rather firm, quite rich. Tender, needs covering in winter. Late; rather unproductive.

Grove-End Scarlet. (*Syn.* Atkinson Scarlet.) Medium, bright scarlet, roundish-oblate; flavor pleasant, mild, rather early. English.

Burr's Staminate Seedling. (*Syn.* Burr's Old Seedling.) ize medium, flavor pleasant, hardy, very productive, dapted to all soils. Origin, Columbus, Ohio.

LARGE EARLY SCARLET. Rather large, roundish ovate, regular, bright-scarlet, tender, rich, excellent. Very early, two or three days after Duke of Kent. Productive at the North.

The Old or Virginia Scarlet, the original wild strawberry of this country, is smaller, and three or four days later.

Fig. 294. *Large Early Scarlet.*

Fig. 295. *Prolific Hautbois.*

PRINCE'S PROFUSE SCARLET, is slightly larger than Large Early Scarlet, but bears a close resemblance in other points, except in being *pistillate*. Productive.

Section II. Flowers pistillate.

Bishop's Orange. (*Syn.* Bishop's New.) Large, regularly conical, light scarlet approaching orange, flesh firm, flavor rather acid, high; growth low; leaves hairy. Worthless except on a deep rich sandy soil, well cultivated. For amateurs only.

Crimson Cone. (*Syn.* Dutch Berry.) Medium, uniformly conical, bright crimson, rich, acid.

Dundee. Rather large, roundish oval, regular; fine light scarlet, firm, rich, acid, flavor fine for a large sort. Hardy, a most profuse bearer.

Hudson's Bay. (*Syn.* Hudson, Old Hudson ?) Rather large, ovate, usually with a neck, often without, dark rich red; flesh firm, of a high, brisk acid flavor, requiring full maturity to be fine. Rather late. Profusely productive.

A. J. Downing regards the Hudson's Bay as identical with the Old or Cincinnati Hudson, so extensively cultivated as a market fruit in southern Ohio. His opinion is disputed by N. Longworth and others, of Cincinnati.

The Willey of Ohio, resembles the Hudson, is a most profuse bearer, even with trifling care, but the flavor is not first-rate.

Methven Scarlet. (*Syn.* Methven, Methven Castle.) Very large, roundish or coxcomb-shaped; color rather dull scarlet, soft, insipid, often hollow; season medium.

Roseberry. (*Syn.* Aberdeen, Scotch Scarlet.) Size medium, ovate-conical, with a short neck, dark red, flesh firm, flavor tolerable; season medium.

The Black Roseberry is better in quality, dark purplish red, a poor bearer.

Class II. Pine Strawberries.

Section I. Flowers Staminate.

Boston Pine. Large, roundish, very slightly conical, regular, deep red, flesh pale scarlet, solid, rich-flavored, hardy. Origin, Boston, Mass. New. Sometimes very productive; often nearly sterile. It requires a strong deep soil, good cultivation, and the thorough removal of the runners.

Brewer's Emperor. Large, ovate, dark red, of fine flavor; resembles Keene's Seedling, but hardy and productive. English. New.

British Queen, (Myatt's.) Very large, roundish, sometimes coxcomb-shaped, color rich scarlet; flavor rich; tender, rather early. A poor bearer, and hence unworthy of cultivation.

Deptford Pine, (Myatt's.) Very large, long-conical, wedge-shaped, color a clear bright scarlet, dark red in the sun; flesh firm and solid, flavor rich and good. Season medium. Moderately hardy. A poor bearer. English. New.

Keene's Seedling. Large, roundish-oblate, often coxcomb-shaped, shining, dark purplish scarlet, firm, rich, high-flavored. Rather early. Of the highest reputation in England, but tender, unproductive and valueless here.

Myatt's Eliza. Large, conical, with a mild, sweet, high, fine flavor—very unproductive. English.

Prince Albert. Very large, showy; ovate, color a rich scarlet; rather soft, flavor poor.

Old, or Carolina Pine. Large, conical, necked, sometimes coxcombed; bright scarlet, solid, juicy, rich. Season medium; of difficult culture.

Ross Phœnix. Very large, usually coxcombed or compressed, dark red, flesh firm, of fine flavor for a large sort; season medium. Sometimes very productive; but usually fails on heavy clay, and scorches on light gravel. An uncertain variety. Origin, Hudson, N. Y.

Swainstone Seedling. Large, ovate, or ovate-conical, color very bright red, high-flavor, rich, delicate, of the highest quality; a very poor bearer, so as to be hardly worth cultivating. English.

Section II. Flowers pistillate.

Black Prince. Quite large, roundish ovate, often approaching oblate, seeds slightly sunk; flesh firm, with a mild, agreeable, fine flavor. Season medium, very hardy, rather productive. Leaves large, flat, petioles quite downy. Fails at Cincinnati.

BURR'S NEW PINE. Large, an inch to [illegible]ch and a fourth in diameter, roundish conical, smooth, even and regular, seeds scarcely sunk, color pale red, flesh whitish pink, very tender, flavor fine. Exceedingly prolific and with perfect berries. Leaves large, spreadin .

Fig. 296.—*Black Prince.*

Fig. 297.—*Burr's New Pine.*

Fig. 298—*Hovey's Seedling.*

HOVEY'S SEEDLING. Very large roundish-oval, approaching conical; color deep shining scarlet; seeds slightly sunk; firm, rather rich, good. Very large, showy, productive, and hence fine for market. Season medium. In some soils at the north, it is liable to be thrown out by frost; it cannot thrive if allowed to run thickly together, and proves unproductive except when well cultivated.

Neck Pine. Large, with a slender neck; color light red flesh nearly white, rather acid, of fine flavor. Very pro ductive, early,—much cultivated at Cincinnati.

Class III. Alpine and Wood Strawberries.

Red Alpine. (*Syn.* Alpine Monthly.) Rather small, long conical; seeds not sunk; color red; quite sweet, mild, not high flavored; ripens a good crop just after the usual strawberry season, and if damp and shaded, through the season till winter frosts. An abundant autumnal crop is secured by clipping the spring blossoms.

The White Alpine is quite similar, except in its light yellowish or nearly white fruit.

Red Wood. Resembles the Alpine in size, flavor, and general appearance, but has rounder fruit, and does not continue so long through the season.

The White Wood only differs in its light colored fruit.

Bush Alpine. The Red and White Bush Alpine, resemble the common Alpines in every particular, except in an entire destitution of runners. Hence they grow in compact bunches, and are considered valuable as edging for kitchen garden beds. They are necessarily propagated by dividing the roots. They bear through the whole season, even more uniformly than the common Alpines.

The Alpine and Wood Strawberries are easily propagated from seed, with very little or no variation.

Class IV. Hautbois Strawberries.

Prolific. (*Syn.* Conical Hautbois, Musk Hautbois, Double Bearing.) Large, long ovate-conical, light purple becoming dark purplish red, surface slightly irregular, seeds projecting; much esteemed by some for its rich, fine musky flavor, and disliked by others.

This is the only variety of the Hautbois worthy of cultivation.

The Chili and Green Strawberries, appear to be unworthy of cultivation. Of the former, Wilmot's Superb, a very showy, large, roundish or coxcombed fruit, with a pale red surface, and hollow, insipid flesh, has excited the most attention.

CHAPTER XI.

THE GRAPE.

PROPAGATION. The vine is propagated by *seeds*, *layers*, *cuttings*, and by *grafting*.

Seeds are planted only for obtaining new varieties, by cross-fertilization, as described in an early chapter of this work.

Layers furnish a very sure mode of obtaining large well rooted plants the same autumn after the young shoots are buried in the soil, which may be done a little before midsummer.

Cuttings are less certain of success than layers, but are usually more convenient, and admit of more rapid multiplication. They should be a foot long and planted sloping, and should just reach up to the surface of the soil, which should be rich, deep, and rather moist. They strike more readily under a frame of glass. The modification of cuttings denominated *eyes* has been already described.

Grafting is sometimes useful for changing large vines of worthless sorts to a better, and bearing fruit in less time than a young vine on its own roots. To prevent bleeding, the work must be done below the surface in the root; or after the leaves are expanded, the scions having been preserved in a cool cellar for this purpose.

Soil. "The essence," says Downing, "of all that can be said in grape culture respecting soil, is that it be *dry* and *light*, *deep* and *rich*." A dry bottom is highly essential; hence a bed of stones, shells and bones, eighteen inches beneath the surface, has been very useful. The manure must be in some degree adapted to the nature of the soil, but generally, vegetable mould or muck, with a portion of ashes intermixed, as already prescribed for fruit trees, is one of the very best.

Pruning and Training. The grape admits of a great

diversity in treatment, and many have their own peculiar modes of pruning and training. General rules are applicable to all. Universal experience proves that cutting away a large portion of the wood every autumn or winter, is indispensible to the regular and continued production of fine fruit. The bunches are borne near the base of the present year's growth; and in the mode termed *spur-pruning*, these side-shoots on the single main stem are annually cut off, to be annually replaced by new shoots springing from buds left for this purpose, fig. 298. In the *long-cane* or *renewal* system, more than one main stem is allowed to grow; and each year every alternate stem is cut down to send up a new shoot in its place, the previous year's shoots bearing the present year's grapes on its side shoots. Spur pruning is best adapted to the more slowly growing or foreign sorts; and the renewal pruning to the more vigorous or American. Fig. 299, exhibits the usual mode of training American grapes, (the trellis not being represented,) every upright shoot of which may be treated as a permanent stem and spur pruned; or else every alternate shoot cut out each year, as in the renewal mode. These upright shoots should be three feet apart, if spur pruning is adopted; and two feet, if the alternate shoots only, are permitted to bear.

Fig. 298. *Spur Pruning.*

The summer treatment of grapes consists chiefly in thinning the shoots where there is danger of the leaves becoming crowded; thinning out the bunches; and, on exotic sorts, thinning out freely the berries. The frequent practice of nipping off the ends of the shoots, just above the bunches, when the grapes are as large as a pea, lessens their subsequent growth. For all fruits grow and ripen best when fed from a good supply of well grown but not crowded leaves, hence the foliage should not be lessened, nor the shoots shortened, until they interfere with each other's full development.

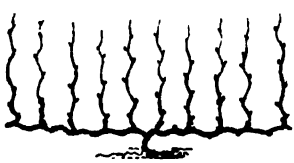
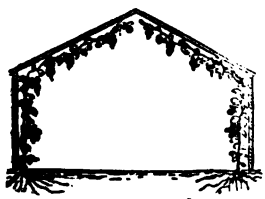


Fig. 299—*Training hardy grapes*

Grape Houses. It rarely occurs that the foreign varieties are successfuly cultivated in the open air, and the protection of glass becomes necessary. The increased certainty of a crop, and the greatly improved flavor of the fruit, can be hardly comprehended by those who have only seen the more hardy foreign sorts ripened in open air. A house without fire heat, is comparatively cheap, and managed with moderate attention.

Grape houses are of three kinds, the *cold house*, which only protects from the exterior changes of the weather, and retains the heat of the earth and of the sun; the *forcing house*, used for ripening early grapes by the assistance of artificial heat; and the *late house*, to be also heated artificially, to ripen, during winter, the later varieties.

Fig. 300.—*Span-roof Grapery.*



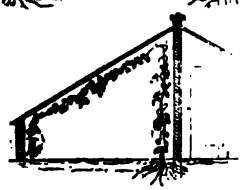


Fig. 301.—*Lean-to Grapery.*

The best cold houses are made with *span-roofs*, as in fig. 300; while the *lean-to* house, fig. 301; is best adapted to forcing, affording better security against the admission of cold. For this purpose the latter should also have a double wall at the back. To admit the free passage of the roots under the walls, the border being on both sides, the posts should be either stone or brick piers, set deep enough in the ground to be unaffected by frost, and the walls built upon thick connecting slabs of stone near the surface. Posts of durable timber will last many years, when the structure is built of wood. In the latter instance, the back wall should be double-planked, and the space between filled with closely rammed dry tan. The sashes for the roof should be of two lengths, lapping slightly at the middle, and sliding past each other in separate grooves.

Border for the Vines. This should never be less than 12 feet wide, and if 20 or 25 feet, it would be better. The roots of grape vines run rapidly to a great distance, and it is indispensable to their successful growth to furnish them

ample room for extension. J. F. Allen, of Salem, Mass., a most successful cultivator, in his Treatise on the Grape, recommends for a border, a mixture of one-half loam, or the top soil of an old pasture, one-fourth bones or other strong manure, one-eighth oyster shells, lime, or brick rubbish, one-eighth rotten stable manure — varying with circumstances. The bed should be well mixed, and should be two to three feet deep.

The same work states the cost of a cheap lean-to grape house, without fire heat, 12 or 14 feet wide, at about eight dollars per running foot; and with the addition of a heating apparatus, at ten dollars per running foot, constructed as cheaply as possible.

It would be impossible, within the space of a few pages, to give full directions for the management of a grape house. The following brief instructions, from A. J. Downing, contain all that is essential for a cold house:

"ROUTINE OF CULTURE. In a vinery without heat this is comparatively simple. As soon as the vines commence swelling their buds in the spring, they should be carefully washed with mild soap suds, to free them from insects, soften the wood, and assist the buds to swell regularly. At least three or four times every week, they should be well syringed with water, which, when the weather is cool, should always be done in the morning. And every day the vine border should be duly supplied with water. During the time when the vines are in blossom, and while the fruit is setting, all sprinkling or syringing over the leaves must be suspended, and the house should be kept a little more closed and warm, than usual, and should any indications of mildew appear on any of the branches, it may at once be checked by dusting them with flour of sulphur. Air must be given liberally every day when the temperature rises in the house, beginning by sliding down the top sashes a little in the morning, more at mid-day, and then gradually closing them in the same manner. To guard against the sudden changes of temperature out of doors, and at the same time to keep up as moist and warm a state of atmosphere within the vinery as is consistent with pretty free admission of the air during sunshine, is the great object of culture in a vinery of this kind.'

The minute and extended directions required for the successful management of a forcing and late house, would far exceed the limits here assigned; for these and a large fund of other valuable information relative to grape culture, the reader is referred to Allen's Treatise on the Grape.

Insects. The smaller insects may be repelled by syringing with a solution of whale-oil soap; the beetles may be knocked off into tin cups containing turpentine. Open-mouthed bottles, partly filled with sweetened water, will decoy many.

Mildew. This is a formidable obstacle to the culture of foreign grapes in open air, both in the north and south. The only effectual remedy is the renewal of the vines every three or four years.

The *rot* has in some seasons proved a formidable disease in vineyards—its cause and cure require further examination and experiment.

Bleeding, or the rapid escape of the sap by spring pruning, causes much less injury than is usually supposed, and many cultivators who have made the experiment thoroughly, have scarcely perceived any unfavorable result on hardy grapes.

NATIVE GRAPES.

Alexander's. (*Syn.* Cape Grape, Schuylkill Muscadel, Spring-Hill Constantia.) Bunches not shouldered; compact; berries medium, nearly round, slightly oval; skin thick, black; pulp firm, coarse, acid until fully ripe; season late. Worthless in New-England and New-York good at Cincinnati. A native of Pa.

Bland. (*Syn.* Bland's Virginia, Powell.) Bunches loose; berries round, pedicels long; skin thin, pale red, flesh slightly pulpy, pleasant, delicate, sprightly. Late; rarely ripens well as far north as 43 degrees lat. A moderate bearer. Origin, Va.

CATAWBA. Bunches medium in size, shouldered; berries large, pale red, deeper in the sun, with a thin lilac bloom; flesh slightly pulpy; juicy, sweet, aromatic, rich, slightly musky. Does not ripen well as far north as 43 degrees latitude, except in warm exposures. Very productive.

To Kalon, a sub-variety is not pulpy, but a poor bearer,

Pond's Seedling, another sub-variety, is earlier, but unproductive.

Clinton. Bunches medium or small, not shouldered, compact; berries nearly round, small, black; bloom thin blue; pulpy, juicy, with a slightly harsh flavor. Very hardy and rather early. Western New-York.

DIANA. A seedling from the Catawba, which it resembles, but paler, or a pale greyish red, bunches loose, berry round, almost without pulp, juicy, sweet, rich. It ripens earlier than the Isabella. Origin, Milton, Mass.

ELSINBURGH. (*Syn.* Elsinborough.) Bunches rather large, loose, shouldered; berries quite small, skin thin, black; bloom blue; pulp none; melting sweet, excellent. Leaves deeply five-lobed, dark green; wood slender, joints long. Hardy. New-Jersey.

ISABELLA. Bunches rather large, shouldered; berries round-oval, rather large; skin thick, dark purple becoming nearly black, bloom blue; tender, with some pulp which lessens as it ripens; when fully ripe juicy, sweet, rich, slightly musky. Ripens as far north as 43 degrees lat., except in unfavorable seasons. Very vigorous, profusely productive. Origin, South Carolina.

Troy Grape and Hyde's Eliza are sub-varieties of the Isabella, possessing no remarkable qualities.

LENOIR. Bunches large, handsome, compact, little shouldered; berries small, round; skin thin, dark purple, bloom slight; tender, with no pulp, melting, sweet, excellent. Wood long jointed, leaf three-lobed. Origin, Carolina; a supposed seedling from the Burgundy.

The Herbemont closely resembles the Lenoir, but is of less vigorous growth, and darker colored wood; its terminal leaves are of a brownish cast, those of the Lenoir green.

Missouri. Bunches loose; berries small, round; skin thin, nearly black; tender, sweet, pleasant, with little pulp; moderately productive, growth slow, wood short-jointed, leaves deeply three-lobed.

Norton's Seedling. (*Syn.* Norton's Virginia.) Bunches long, compact; berries small, round; skin thin, dark pur-

ple; pulpy, vinous, somewhat harsh, [illegible]ant and rich. Shoots strong, hardy; a hybrid between Bland and Miller's Burgundy. Foliage light colored, five-lobed.

OHIO. (*Syn.* Longworth's Ohio, Segar-Box.) Bunches large, long, loose, tapering, shouldered; berries small, round; skin thin, purple, bloom blue; tender, melting, sweet, excellent, with no pulp; a good bearer. Shoots long-jointed, strong; leaves large, three-lobed; origin unknown. As far south as Cincinnati, it succeeds well and is a fine table grape, resembling the Elsinburgh, but is rather tender at Cleveland, and fails as far north as 43 degrees lat.

Scuppernong. (*Syn.* Fox Grape or Bullet Grape, of the South; American Muscadine.) This is a distinct southern species the *Vitis vulpina.* Bunches very small, loose; berries round, large; skin thick; pulpy, juicy, sweet, strongly musky. The "White" is light green; the "Black" dark red; the color of the tendrils corresponding in each variety. Leaves quite small, glossy on both sides. Very tender at the North.

FOREIGN GRAPES.

As but few of these can be cultivated successfully in open air, and extensive grape houses cannot become very common, a few of the best only are described.]

CLASS I. DARK RED, PURPLE AND BLACK.

BLACK CLUSTER. (*Syn.* Burgundy, Black Burgundy, True Burgundy, Small Black Cluster, Early Black, Black Orleans.) Bunches small, very compact, berries rather small, roundish, black, sweet, good. Season, early mid-autumn. Hardy in N. Y. Distinguished from Miller's Burgundy by the absence of down on the leaf.

BLACK HAMBURGH. (*Syn.* Red Hamburgh, Purple Hamburg, Brown Hamburgh, Frankendale, Hampton Court Vine.) Bunches large, shouldered on both sides berries very large, roundish, sometimes oval, deep brownish purple, becoming black; flavor sugary and rich. A good bearer. Needs a grape house, rarely ripening well in the open air.

Wilmot's [redacted]burgh is similar, fruit larger, bloom very [redacted], flesh firm, nearly or quite equal to the common Hamburgh.

BLACK PRINCE. Bunches very long, not wide at base; berries large, thinly set, oval; skin thick, black, with a thick blue bloom; flavor sweet and excellent. A good bearer. Sometimes ripens in the open air.

Black St. Peters, Black Portugal, and Cambridge Black, much resemble this variety.

Early Black July. (*Syn.* July, Madeleine.) Bunches small, compact; berries small, spherical, black, bloom blue, skin thick; flavor acid, becoming rather sweet, not rich. Very early, ripens in open air soon after mid-summer.

CLASS II. WHITE, OR YELLOW.

CHARLESWORTH TOKAY. Bunches long, compact; berries large, oval, white, skin thick, with a rich, excellent, muscat flavor. Hangs long, and is adapted to a forcing or late house. New. English.

EARLY WHITE MALVASIA. (*Syn.* Grove End Sweetwater, Early Chasselas, White Mellier.) Bunches large, shouldered; berries round, yellowish white; skin thin; sweet, juicy, agreeable. Early, good bearer, ripens in open air.

PITMASTON WHITE CLUSTER. Bunches small, compact, shouldered; berries small, round, amber colored, sometimes with a little faint russet when fully ripe; skin thin, flesh tender, juicy, rich, of fine flavor. Open air, cold or forcing house. A seedling from Black Cluster, ripening before Sweetwater.

ROYAL MUSCADINE. (*Syn.* Chasselas, Golden Chasselas, White Chasselas, Early White Teneriffe, Chasselas de Fontainebleau, White Muscadine of some.) Bunches large, long, sometimes shouldered; berries rather large, round, greenish, becoming a golden amber; skin thin, flesh tender, rich, delicious. Does not hang well—cracks some seasons. Distinguished from Sweetwater by its larger berries, and stronger growth of shoots.

Chasselas de Bar Sur Aube, much resembles the Royal Muscadine, but is earlier, and rather superior in flavor; the bunches, under good cultivation, are often ten or twelve inches long, usually not shouldered; very productive. For forcing or cold house.

Syrian. Bunches enormously large—have weighed 19 lbs., being 22 inches long and 19 broad—irregular, shouldered, berries large, oval, tawny yellow; skin thick, flesh firm, solid, moderately juicy and sweet, not rich. Late; needs fire heat; hangs well. Wood and foliage large. Supposed to be the grape of Eschol, mentioned in the Sacred Scriptures.

WHITE MUSCAT OF ALEXANDRIA. (*Syn.* Jerusalem Muscat, Malaga, Frontignac of Alexandria, Passe Musqué.) Bunches very large, 9 to 12 inches long, loose, irregular, do not set well; berries very large, oval, an inch long, pale amber, skin thick; flesh firm, crisp, rich, delicious, perfumed—often seedless. One of the richest Muscat grapes—Downing says, "the most delicious of all grapes." Needs a vinery, and best with fire heat—hangs long.

Fig. 302.—*White Muscat of Alexandria.* Reduced to ¼ diameter.

The Cannon-Hall Muscat, is a seedling sub-variety, improved in size, but hardly so rich in flavor.

The Tottenham Park Muscat, also a sub-variety, is not quite so rich as the original, but sets better, and hangs well.

WHITE FRONTIGNAN. (*Syn.* White Frontignan, Muscat Blanc, White Constantia.) Bunches medium in size or long, sometimes shouldered, usually not, rather dense; berries medium or large, round, dull white or yellow, when well ripened a beautiful amber, bloom thin, skin thin; tender, rich, perfumed, one of the best Muscat grapes. Productive in a vinery, adapted to a cold, forcing, or late house—requires a dry situation; on a wet soil, not worth cultivating. Ten days later than Hamburgh.

WHITE NICE. Bunches very large—have weighed eighteen pounds—shouldered, loose; berries medium or rather small, round; greenish-white, approaching yellow, sweet good, rich-flavored; hangs well. Growth strong, leaves very downy beneath. Needs fire heat.

WHITE SWEETWATER. (*Syn.* Early White Muscadine, White Muscadine *of Lind.*, Early Sweetwater.) Bunches medium in size, loose, usually shouldered; berries medium size, round, yellowish green, skin thin; crisp, watery, sweet, moderately rich. Inferior to Royal Muscadine, but two weeks earlier, ripening by the end of summer. Ripens in open air; shoots tender.

White Tokay. (*Syn.* Genuine Tokay.) Bunches medium in size, compact; berries round-oval, dull white; skin thin; delicate, sweet, perfumed. Leaves deeply five-lobed, lower surface with a silky down. Ripens in open air.

CLASS III. LIGHT RED.

GRIZZLY FRONTIGNAN. (*Syn.* Red Constantia, Red Frontignan, Gray Muscat.) Bunches rather long, narrow, slightly shouldered; berries medium in size, round, compact; reddish grey, bloom thick; juicy, rich, musky, high-flavored; hangs well, ripens before Hamburgh, and the other Frontignans. For forcing, cold or late house.

CHAPTER XII.

SELECT LIST OF VARIETIES, ADAPTED TO DIFFERENT LOCALITIES OF THE UNION.

In the body of this work, the type used for the names of varieties, will enable the inexperienced cultivator to prepare select lists of greater or less extent, a few of the most valuable being in capitals, a larger number of less general value in small capitals, and a still larger number in italics. But as the same sort does not often succeed alike in all regions, it becomes desirable to obtain lists of those fruits best adapted to particular localities. The following are given for this purpose.

THE LIST ADOPTED BY THE AMERICAN CONGRESS OF FRUIT-GROWERS, *held in New-York city, in* 1848, *and adapted to the more northern and eastern portions of the Union:*

Apples—Early Harvest, Bough, American Summer Pearmain, Summer Rose, Early Strawberry, Gravenstein, Fall Pippin, Rhode Island Greening, Baldwin, Roxbury Russet; *and for particular localities*,—Yellow Bellflower, Esopus Spitzenburgh, Newtown Pippin—13.

Pears—Madeleine, Dearborn's Seedling, Bloodgood, Tyson, Golden Bilboa, Bartlett, Seckel, Flemish Beauty, Beurré Bosc, Winter Nelis, Beurré d'Aremberg; and *for particular localities*, White Doyenné, Grey Doyenné—13.

Peaches—Grosse Mignonne, George IV., Serrate Early York, Large Early York, Morris White, Oldmixon Free, Cooledge's Favorite, Bergen's Yellow, Crawford's Late; and *for particular localities*, Heath Cling—10.

Plums—Jefferson, Green Gage, Washington, Purple Favorite, Bleecker's Gage, Coe's Golden Drop, Frost Gage, Purple Gage; and *for particular localities*, Imperial Gage —9.

Cherries—Mayduke, Black Tartarian, Black Eagle, Graffion or Bigarreau, Knight's Early Black, Downer's Late, Elton, Downton—8.

SELECT LIST *prepared for this work, by* SAMUEL WALKER, *President of the Massachusetts Horticultural Society, as in accordance with his own experience, and in the order of their value, all things considered.*

Apples—Rhode Island Greening, Gravenstein, Baldwin, Early Harvest, Minister, Danver's Sweet, Bough, Roxbury Russet, Dyer, White Seeknofurther, Summer Rose, Porter, Hubbardston Nonesuch, Fameuse, Summer Pearmain, Fall Harvey, Red Astrachan, Fall Pippin, River, William's Favorite—20.

Pears—Vicar of Winkfield, (for its size, productiveness, long continuance, and many uses,) Bartlett, Beurré d'Aremberg, Seckel, Fondante d'Automne, Urbaniste, Bloodgood, Louise Bonne of Jersey on quince, Winter Nelis, Dearborn's Seedling, Flemish Beauty, Glout Morceau, Madeleine, Beurré Bosc, Beurré Diel on quince, Rostiezer, Heathcote Passe Colmar, Andrews, Golden Bilboa, Tyson, Dix—22.

Cherries—Black Tartarian, Black Eagle, Downer's Red, Mayduke, Bigarreau, Knight's Early Black—6.

Peaches—Grosse Mignonne, George IV., Oldmixon Free, Cooledge's Favorite, Crawford's Late, Late Red Rareripe—6.

Plums—Green Gage, Jefferson, Purple Gage, Columbia, Washington, Imperial Gage—6.

Apricots—Moorpark, Breda, Royal.

Nectarines—Elruge, Hunt's Tawny, New White, Early Newington, Early Violet, Roman—6.

Native Grapes—Isabella, Catawba.

LIST *furnished by* R. MANNING, *Pomological Garden,* Salem, Mass.*

Three best pears, early, middle, and late—Bartlett, Paradise d'Automne, Winter Nelis.

Three best summer pears—Bloodgood, Rostiezer, Dearborn's Seedling.

Three best autumn—Bartlett, Paradise d'Automne, Urbaniste.

Three best winter—Winter Nelis, Beurré d'Aremberg, Easter Beurré.

* Where nearly one thousand sorts are in bearing. T. Rivers, in England, has selected out of nearly one thousand, only *four* for market, viz., *Bartlett, Beurre d'Amalis, Capiaumont*, and *Louise Bonne of Jersey*. The second and third, however, prove no better than second quality, in this country.

Three best orchard pears—Bartlett, Fulton, Vicar of Winkfield.

Three best apples—Summer Rose, Gravenstein, Baldwin.

SELECT LIST OF APPLES, *by* B. V. FRENCH, *Braintree, Mass.*

Three best apples—Porter, R. I. Greening, Baldwin.

Three best summer—Early Harvest, Red Astrachan, Williams' Favorite.

Three best autumn—Porter, Fameuse, Gravenstein.

Three best winter—Rhode Island Greening, White Seeknofurther, Baldwin.

For the six best for each season, add to the preceding,—American Summer Pearmain, Bough, Benoni; St. Lawrence, Lyscom, Hawthornden; Yellow Bellflower, Nonesuch (or Red Canada,) Roxbury Russet.

IN A LIST FURNISHED BY Dr. W. D. BRINCKLE, of Philadelphia, the following standard sorts, well tested at that place, are marked *first quality*:—

Apples—Early Harvest, Summer Rose, (best flavored early,) Early Bough, Summer Pearmain, Fall Pippin, Bullock's Pippin, Winter Pearmain.

Pears—Madeleine, Tyson, Washington, Bartlett, Seckel, Petre, Lodge, Fondante d'Automne, Louise Bonne of Jersey, Duchesse d'Angouleme, Echassery. *New pears.*—Ott, Kingsessing, Brandywine, Chancellor, Jones.

Plums—Green Gage, Washington, Coe's Golden Drop, Lawrence's Favorite.

Cherries—Mayduke and Graffion or Bigarreau.

Strawberries—Early Scarlet, Hudson, Hovey's Seedling

Native Grapes—Isabella, Catawba.

LIST BY T. HANCOCK, *Burlington, New Jersey.*

Peaches—Crawford's Early, Crawford's Late, Large Early York, La Grange, Heath Cling, Ward's Late Free, New-York Rareripe, Scott's Nonpareil, Oldmixon Free, Cole's White Melocoton.

Native Grapes—Elsinburgh, Catawba, Isabella.

Foreign Grapes—Black Hamburgh, (best and most profitable for a cold house,) White Muscat of Alexandria. Both fine for a heated house.

—White Antwerp, Red Antwerp, (true,) Fasnia.

Apples—Lady Apple, Autumn Pearmain, Bough, Cumberland Spice, Early Harvest, Fall Pippin, Wood's Greening, Red Juneating, Jersey Greening, (or Ortley,) Maiden's Blush, Newtown Pippin, Newark Pippin, Rhode Island Greening, Roman Stem, Bullock's Pippin, Summer Rose, Summer Pearmain, Wine apple, Winesap, Tewksbury Blush, (for keeping.)

LIST *by* T. S. PLEASANTS, *Petersburgh, Va.*

Apples—May Apple, Red June, July Branch, Fall Pippin, Gloucester Cheese, Fall Cheese, Bellflower, Winter Cheese, Carter's Pearmain, Winesap, Albemarle Pippin, Pryor's Red, Old Town Crab, Limber Twig.

Peaches—ripening in 7 mo., (July)—Early Tillotson, Troth's Early Red, Yellow Rareripe, Red Magdalen, Oldmixon Free, Large Early York, Crawford's Early, Early Newington Cling, Royal Kensington, Royal George. *Ripening in 8 mo.*—Belle de Vitry, Orange Freestone, Orange Clingstone, Rodman's Cling, Oldmixon Cling, Crawford's Late, Ward's Late Free, Pavie Admirable. *In 9 mo.*—Heath Cling, La Grange. *The following new or local sorts*: Budd's Orange Clingstone, early in 9 mo.; Late Soft Heath, (freestone,) nearly middle of 9 mo.; Bridgeforth's Orange, (fine and very handsome,) after middle of 9th mo.; Late Heath Cling, a month later than common Heath Cling; Late White Freestone and October peaches, first to middle of 10 mo.

Native Grapes—Catawba, Isabella, Norton's, Herbemont's, Lenoir, Halifax.

Figs—The best kinds are the Brown, White, and Black or Florida fig, the last superior to all others, the fruit large and exceedingly rich, skin deep purple, almost black; trees very productive. The brown is nearly equal to it—the White is much less luscious, but very large.*

* The fig is one of the most luscious of fruits, and grows well in the open ground, with very slight protection; and on our large water courses, within the precincts of towns, and even against any walls, having an eastern, southern, or western aspect, without any immediate protection. When the plants are young, they should be enclosed for one or two winters in barrels filled with litter or leaves; afterwards it is sufficient to surround them with branches of evergreens."—*T. S. Pleasants.*

LIST OF APPLES, *ripening in succession, by* A. H. ERNST, *President of Cincinnati Hort. Society.*

Sweet Bough, Early Harvest, Summer Rose, Fall Pippin, Golden Russet, (or Bullock's Pippin,) Newtown Spitzenburgh, Yellow Bellefleur, Woolman's Long (or Ortley or White Detroit,) White Pippin, Brodwell, Winesap, Yellow Newtown Pippin, Rawle's Jannet—13. Add for a larger collection,—Red Juneating, Summer Queen, Golden Sweeting, Kaighn's Spitzenburgh, Rhode Island Greening, Rambo, Pryor's Red, Vandevere, Doctor, Roxbury Russet—10.

Pears ripening in succession, proved excellent at Cincinnati—Madeleine, Julienne, Bartlett, Washington, Gray Doyenné, Seckel, Duchesse d'Angouleme, Beurré Diel, Louise Bonne of Jersey.

Strawberries—Neck Pine, earliest; Old Hudson, unrivalled for the market gardener; Jenny's Seedling,* very hardy, prolific; Hovey's Seedling, its position not yet fully established; Taylor's Seedling,† promises to be valuable.

SELECT LIST *by* F. R. ELLIOTT, *Cleveland, Ohio.*

Apples—Best single variety, for northern Ohio,—Belmont or Waxen.

Three best, summer, autumn, and winter;—Summer Rose, Fall Pippin, Red Canada or Nonesuch.

Three best summer—Early Harvest, Summer Rose, American Summer Pearmain.

Three best autumn—Gravenstein, Porter, Fall Pippin.

Three best winter—Belmont, Swaar, Nonesuch.

For the *six best*, for each season, add to the preceding,—Red Astrachan, Williams' Favorite, Early Joe; Fall Harvey, Ross Nonpareil, Rambo; Hubbardston Nonesuch, Canada Reinette, Rhode Island Greening.

For the best *forty*, add to the preceding, Maiden's Blush, Minister, Fameuse, Roxbury Russet, Westfield Seeknofurther, Yellow Bellflower, Court of Wyck, Jonathan, Lady Apple, Herefordshire Pearmain, American Golden Russet, Esopus Spitzenburgh, Pryor's Red, Wood's Greening, Fort

* Fruit medium, uniform, very productive, sharp acid but fine flavor, firm, but fine for market. Pistillate, late bloomer. Origin, Boston.

† Above medium, size uniform, long-conical, pointed, beautiful scarlet, productive, hardy, strong, less acid than most scarlets.

Miami, Wine, Winesap, Brabant Bellefleur, and four sweet apples, viz:—Bough, Jersey Sweeting, Golden Sweeting, Ladies' Sweeting. If the soil be a rich clay loam, substitute Green and Yellow Newtown Pippin for Swaar and Winesap.

Strawberries, in the order of productiveness—Old Hudson and Willey, Dundee, Hovey's Seedling.

LISTS *by* A. J. DOWNING, *chiefly copied from the Horticulturist.*

Profitable Pears—Bartlett, Buffum, Flemish Beauty, Louise Bonne de Jersey on quince, Vicar of Winkfield, Lawrence, Beurré d'Aremberg.

Most productive PLUMS *on light soils*—Lombard, Cruger's Scarlet, Smith's Orleans, White Damson.

Best PLUMS *for heavy soils*—Early,—Imperial Ottoman, Yellow Gage; medium,—Bleecker's Gage, Jefferson; late,—Coe's Golden Drop, Frost Gage.

Three best PEACHES.—Serrate Early York, George IV. Oldmixon Free.

The following list of NEW FOREIGN PEARS, not named in the body of this work, with their size, season, and quality, so far as indicated by a short trial, has been furnished by M. P. WILDER, of Boston. The three grades of quality are indicated by the terms *good*, *very good*, and *best*, and some of them may prove valuable.

	Size.	Season.	Quality.
Bonne des Zees, ...	2	Sept.,	"good," may be "very good."
Benoist, ...	1	Sept.,	promises well.
Beurre de Rhin, ...	1	Nov.,	"very good."
Beurre Triguer, ...	3	Sept.,	"best,"—very rich and sweet.
Belle Excellente, ...	2	Oct.,	"very good."
Bezi des Veterans, ...	2	Oct.,	"very good"—promises well.
Doyenne de Neckerman,	2	Nov.,	"very good,"—handsome red cheek.
Delices de Jodigne, ...	2	Sept.,	"very good," of good promise.
Epine Dumas, ...	1	Oct.,	"very good."
Inconnue Van Mons, ...	2	Jan.,	"very good," perhaps "best," hardy, good bearer.
St. Andre, ...	2	Sept.,	"best," rich and perfumed.
St. Michael Archange, ..	2	Oct.,	"very good," promises well.
Souvrain d'Ete, ...	2	Sept.,	"best," delicious and rich.

PRONUNCIATION OF FOREIGN NAMES.

Names of fruits, strictly French, can be pronounced correctly by those only who speak that language. But a considerable number are becoming rapidly Anglicised, or passing to a sound between French and English, and still differing materially from the spelling. like the common words *chevaux de frize, depot, apropos, belles lettres*, &c. A short vocabulary of these, and chiefly such as do not well admit of English translation, may be of use to those who have no knowledge of foreign pronunciation.

Belle de Choisy, bell d' shwaw ze.
Belle de Vitry, bell-d'-ve-tree.
Belle Magnifique, bell mag-ne-feek.
Beurré, burry. This is often pronounced bury, rhyming with *fury*, but to be correct, it should rhyme with *hurry*.
Beurré d'Amalis, burry dam-mal-lee.
Beurré d'Anjou, burry dan-zhoo.
Beurré d'Aremberg, burry dar-em burg.
Beurré de Capiaumont, burry d'cap-u-mone.
Beurré Diel, burry deel. (Diel, a German pomologist,—hence the pronunciation is not de-ell, French, as sometimes sounded.)
Beurré Gris, burry gree.
Bigarreau, be-gar-ro.
Bonchretien, bone-cre-shan. (French, bong-cra-tyang.
Crassane, cras-sann.
Doyenné, doy-en-nay.
Fameuse, fam-uz.
Fenouillet Gris, f'-nool-ya-gree.
Fortunee, for-tu-na.
Glout Morceau, gloo mor-so.
Gravenstein, grav-en-stine, (German.)
Grosse Mignonne, groce meen-yonn.
Guigne, geen, (g hard.)
Louise Bonne, loo-eze bonn.
Madeleine, mad-lane.
Male Carle, mal-carl.
Marie Louise, mar-re loo-eze.
Nivette, ne-vett.
Nonpareil, non-par-ell. (French, nong-par-ale.)
Pavie, Pav-vy.
Quetsche, quetch-eh. (German.)
Reine Claude, rane clode.
Reinette, ra-nett.
Sieulle, se-ull.
Sine Qua Non, si-ne qua non. (Latin.)
Virgouleuse, veer-goo-luz. Virgalieu, a different word, is pronounced vur-ga-loo.
Vicompte de Spoelbereh, ve-konte d' spool-bairk.

GLOSSARY

Of the more common terms used in Fruit Culture.

Acute, sharp or angular.
Acuminate, drawn out to a point.
Alburnum, the sap-wood, as distinguished from the heart-wood.
Apex, point, the part of a fruit farthest from the foot-stalk.
Base, lower end, or that portion of a fruit, stalk, or part of a plant, nearest the supporting part or root.
Basin, the hollow or depression at the apex or crown of a fruit, surrounding the calyx.
Bezi, a wilding, or natural seedling.
Beurre, a buttery pear.
Border, artificial bed of enriched earth.
Callus, ring or swollen portion formed at the base of a cutting, by the descending cambium.
Calville-shaped, much ribbed, as applied to apples.
Calyx, the outer or green leaves of a flower, which, remaining on the apex of a pear or apple, are often denominated the eye.
Cambium, the soft, newly forming wood beneath the bark.
Canes, long, bearing shoots; applied to grapes and raspberries.
Clipping, trimming down to some definite shape.
Colmar-shaped, pyriform or pear-shaped, with a rather slender neck and large body.
Conical, tapering regularly towards the apex.
Cordate, heart-shaped.
Coxcomb, applied to the form of strawberries when much compressed at the sides.
Crenate, notched or cut like rounded or blunt saw teeth.
Crown, the part of a fruit farthest from the foot-stalk or base.
Curculio, the insect which stings young fruit.
Dwarfs, trees made diminutive by grafting or budding upon stocks of small growth.
Espalier, a tree trained flat upon a trellis.
En quenouille, training to produce fruitfulness by tying the branches downwards.
Fibrous roots, the smaller, branching, or thread-like roots.
Forcing, the early ripening of fruits by artificial heat under glass.
Fore-right shoot, the terminal shoot of a branch.
Head back, to cut off the limbs of a tree, part way down.
Head down, to cut off the entire limbs or branches of a tree, or to cut down to an inserted bud.
Inflorescence, the manner in which the flowers are borne.
Lay-in, applied to selecting and fastening to a trellis or wall, new branches or shoots.
Lay in by the heels, to bury the roots of trees temporarily in a trench.
Leading shoot, the longest or main shoot of a limb or tree.
Lopping, cutting the branch down to the stem.
Maiden plant, a tree of one year's growth from the bud or graft.
Mulching, covering the ground about a tree with straw or litter to prevent drying.

Oblate, flattened, so that the shortest diameter is between the base and apex, like a flat turnip.

Obovate, reversed ovate, being largest from the foot-stalk or towards the apex.

Obtuse, rounded or blunt.

Ovate, egg-shaped, being the largest towards the foot-stalk.

Pedicel, the subdivision of a flower or fruit-stalk.

Peduncle, the flower or fruit stalk.

Petals, flower-leaves, usually colored.

Petiole, leaf-stalk.

Pippin, an indefinite term applied to various apples, differing in size, shape, color, and flavor, but more particularly used for the Newtown Pippin.

Pomology, the science of fruits.

Pyramidal, like a pyramid, usually nearly similar to conical, but longer.

Pyriform, pear-shaped, having more or less a drawn-out neck.

Ringing, the removal of a ring of bark round a branch, to impede the descending sap.

Serrate, notched or cut like saw-teeth.

Shanking, a diseased shrivelling of the foot-stalks of grapes.

Shorten-in, to cut off more or less of the outer parts of shoots.

Spongiole, the minute spongy extremity of a fibrous root.

Sport, an unusual departure or variation in a new seedling.

Spur, a short stubby shoot bearing fruit or fruit-buds.

Standard, a fruit tree in open ground, or not trained to a wall or trellis.

Stock, seedling tree, which supports the inserted bud or graft.

Stop, to pinch or cut off the point of a shoot, to prevent its further extension in growth.

Strike, to emit roots.

Tap-root, the main or central descending root.

Trellis, an upright, flat frame, for training fruit trees and grapes upon its face.

Wilding, a natural seedling.

Work, a term applied to the budding or grafting of trees.